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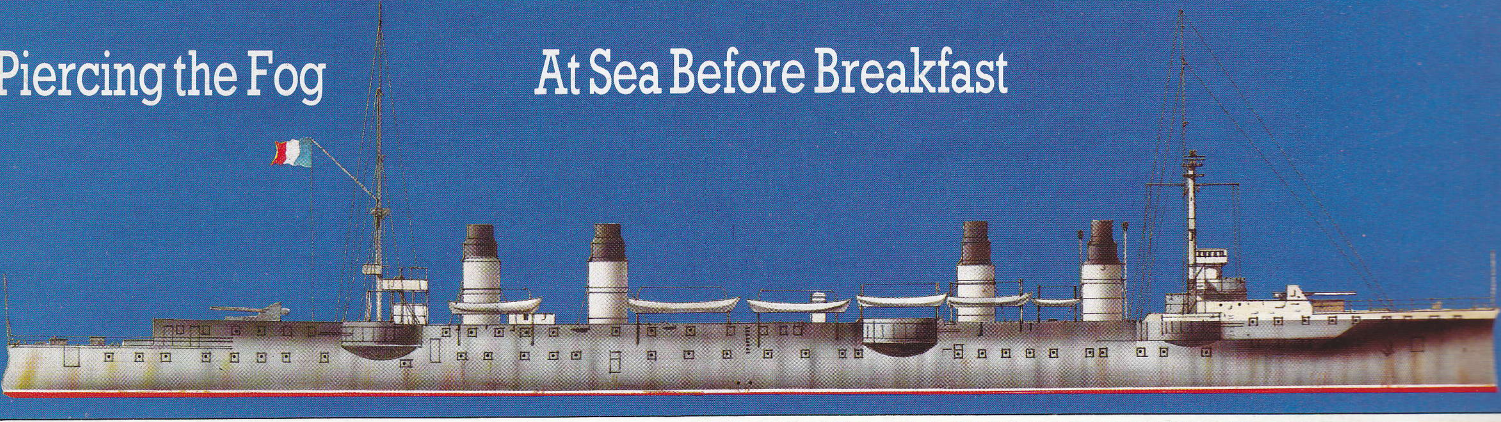

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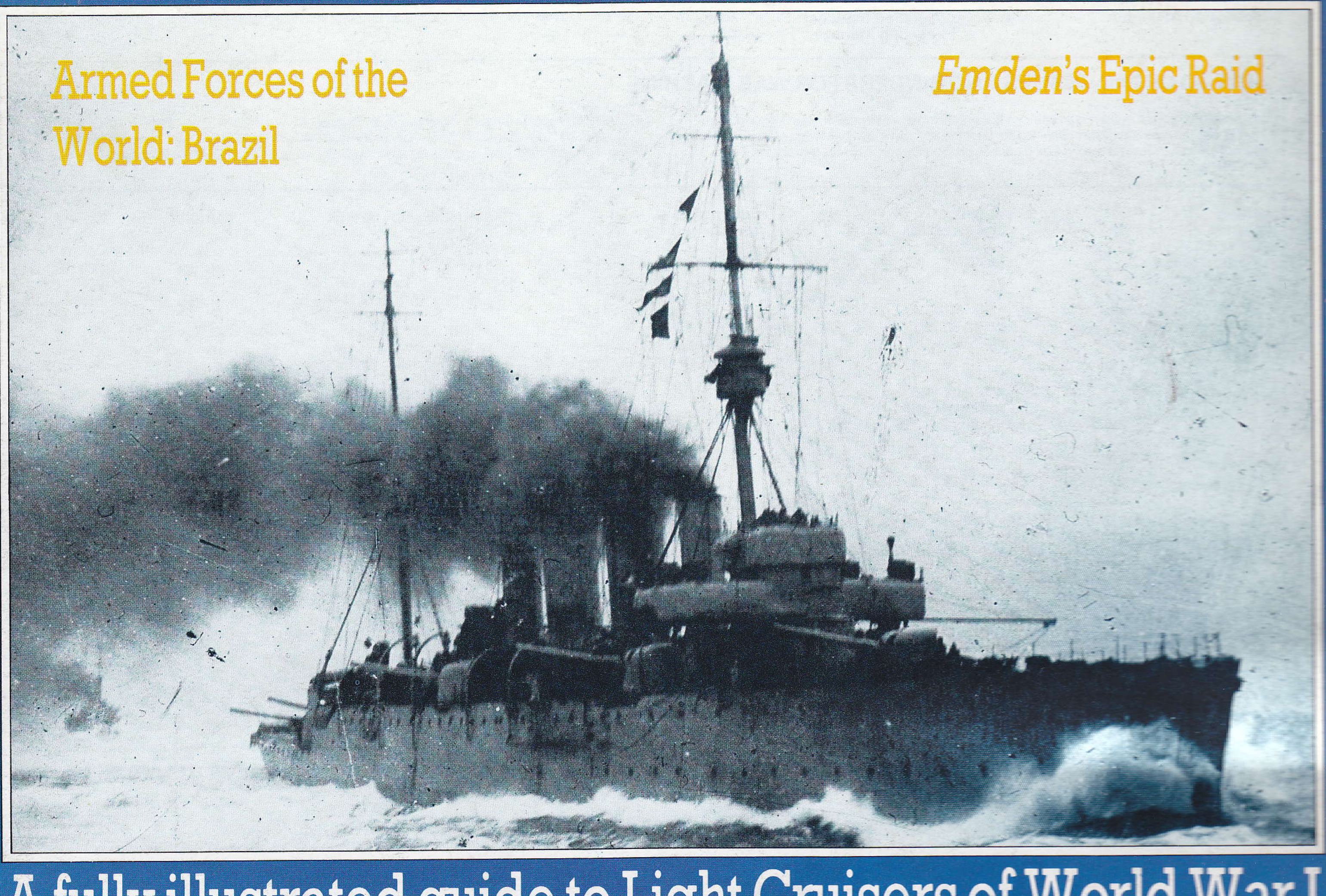

A fully illustrated guide to Light Cruisers of World War I

WAR MACHINE

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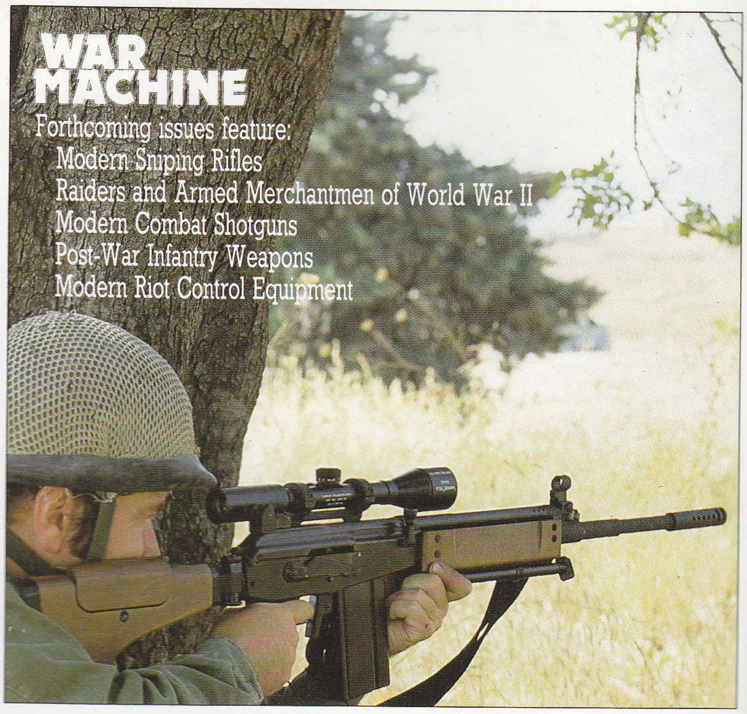

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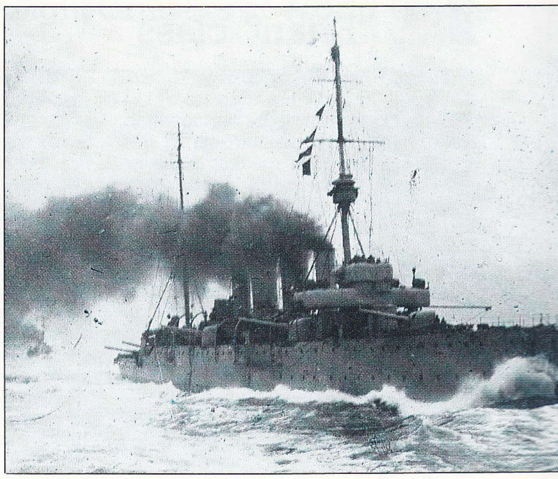
Light Cruisers of World War 1



HMS Southampton *sank the German cruiser* Frauenlob *and the torpedo boat* S 35 *at Jutland but suffered severe damage during the night action.*

The principle task of light cruisers during World War I was to scout ahead of the main battlefleet. But, in the weather conditions of the North Sea, this often meant that these weakly-protected vessels had to venture within range of the enemy battleships' main armament.

'We crouched behind the tenth of an inch plating and ate bully beef, but it didn't seem to go down very easily. It seemed rather a waste of time to eat beef, for surely in the next ten minutes one of those 11-inch shells would get us, they couldn't go on falling just short and just over indefinitely and, well, if one did hit us – light cruisers were not designed to digest 11-inch high explosives. . .' This laconic eyewitness account was by an officer aboard HMS *Southampton* at Jutland, but could equally well have come from a thousand others on either side.

The older fleet concept of pushing forward armoured cruisers to gain intelligence of the enemy had been bankrupted by the arrival of the battle-cruiser and the fast battleship, the job passing to the new generation of light cruisers. To do their job required getting to within clear visual range and this, in typical visibilities, meant well within heavy gun range of the enemy line. It took dedication and nerve to press such a reconnaissance well home with half the bridge observing the enemy line and the other half watching the navigator who manoeuvred the ship rapidly away from where he judged the next salvo would land. He usually got it right.

Virtually unprotected cruisers, relying on their agility to keep out of trouble, were initially difficult for the British Admiralty to accept although, historically, they were close in concept to Nelson's frigates. Once in service, however, both British and Germans found them indispensible. They were deeply involved in every major action and in all the humdrum, unseen and uncomfortable drudgery that lies behind the simple expression 'sea control'. Many were lost but all were valiantly served. Despite their apparent fragility they proved remarkably resistant to gunfire and the endless 'dripping' of their crews concealed a deep-felt love for their ships, few envying those with 'cushier' billets on the big ships.

Nelson said he would die with the words 'want of frigates' engraved on his heart; the Royal Navy's problem before 1914 was a shortage of cruisers fast enough to work ahead of the new generation of fast battleships.

FRANCE

'Friant' class

Intended primarily for colonial duties, the three **'Friant' class** cruisers dated from that splendidly silly period when French ships were unique in the world. Despite their modest size they were built on the same 'fierce face' principles that also governed the armoured cruisers and battleships. Each featured the exaggerated ram bow and bulbous stern that gave buoyancy at either end and extra length to improve the lines. Their high freeboard hulls were two levels deep over their entire length and pierced liberally with rectangular ports rather than the usual scuttles, to improve living conditions in the tropics. The sides were given a pronounced tumblehome.

For their size and date, they were respectably armed with a main battery of six 164-mm (6.4-in) guns. Though these were only 30-calibre weapons, the muzzles of the two sited on the centreline at each end were virtually in line with the deck limits. The remaining four guns were sited on sponsons 'growing' from the steeply-sloping sides, thus gaining a measure of axial chase-fire. The narrow upper deck was sponsoned further to accommodate a 100-mm (3.9-in) gun at each 'corner' and 10 47-mm quickfirers were also supposed to be fitted. At least one unit, the nameship, originally had some of these weapons sited on 'military masts', both guns and masts having to be removed as a result of stability problems.

They were protected cruisers with a full-length 30-mm (1.18-in) armoured deck, arched over the machinery and thickened on the flanking slopes to 80 mm (3.15 in). No less than 20 boilers were divided between three spaces.

The original class consisted of the magnificently-named ***Chasseloup-Laubat*, *Bugeaud*** and ***Friant***, followed by the slightly modified ***du Chayla*, *Cassard*** and ***d'Assas***. A good idea of the breadth of scope open to the older ships in 1914-8 is given by their service in the Caribbean, the Red Sea, the Levant coast and the Dardanelles, the Indian Ocean and the Black Sea.

Specification

'Friant' class

Displacement: 3,880 tons standard

Dimensions: length 95.0 m (311.7 ft); beam 13.0 m (42.7 ft); draught 6.4 m (21.0 ft)

Propulsion: two sets of triple-expansion steam engines delivering 9,500 ihp (7085 kW) to two shafts

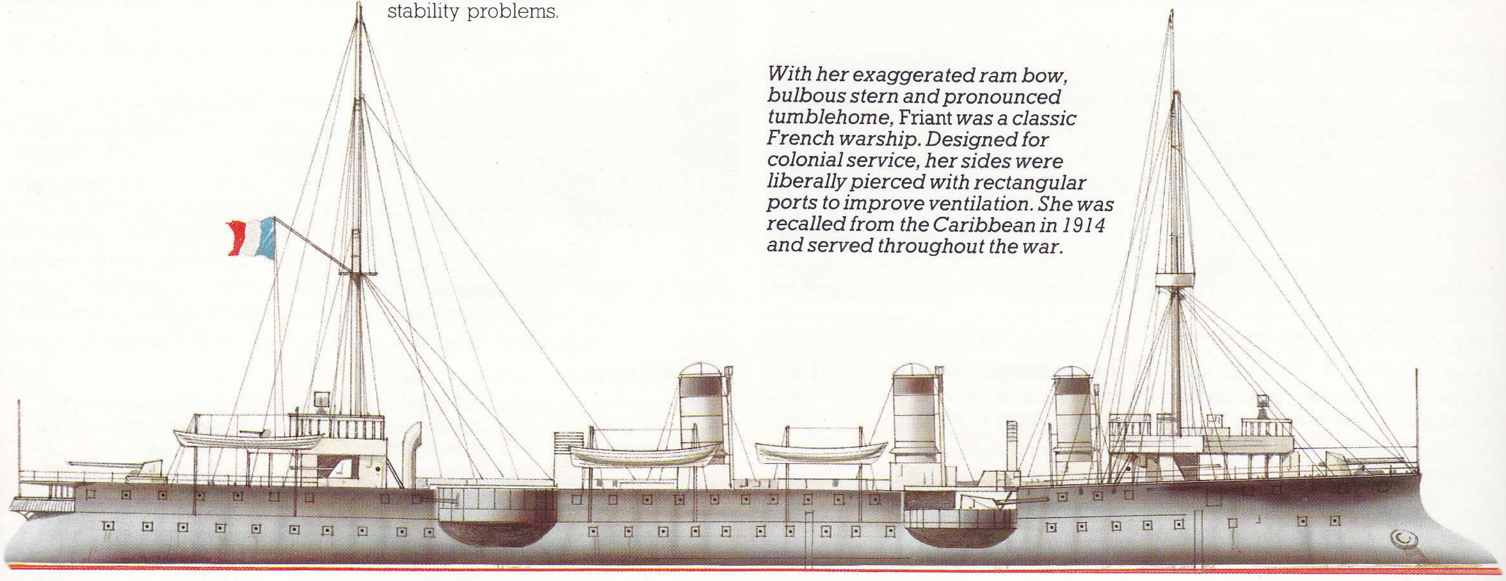
Speed: 18.5 kts

Endurance: 11125 km (6,915 miles) at 10 kts

Armament: six single 164-mm (6.4-in), four single 100-mm (3.94-in) and 10 single 47-mm guns, and two 450-mm (17.7-in) torpedo tubes

Armour: 80-mm (3.15-in) belt

Complement: 375



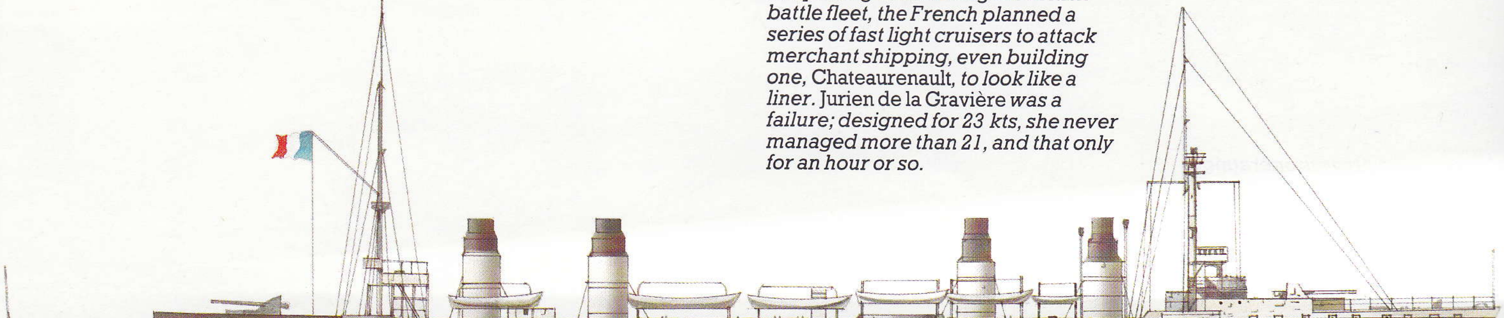
With her exaggerated ram bow, bulbous stern and pronounced tumblehome, Friant *was a classic French warship. Designed for colonial service, her sides were liberally pierced with rectangular ports to improve ventilation. She was recalled from the Caribbean in 1914 and served throughout the war.*

FRANCE

'Jurien de la Gravière' class

As the American USS *St Louis* was to be a diminutive of the 'California' design, so was the ***Jurien de la Gravière*** scaled down from the 'Gueydon' class armoured cruiser, but at an early date. That she was one-off is interesting itself, representing probably the last gasp of the so-called Jeune Ecole movement. This stemmed largely from the beliefs of Admiral Aube during the 1880s that, as the UK was the most likely enemy of France, the latter's fleet should be recast with this in mind. It would be easier, he argued, to adopt a *guerre de course*, defeating the UK economically through the destruction of her mercantile marine rather than her battlefleet. What, therefore, was required were coast defence ships and a large number of corsairs (privateering had been declared internationally illegal by the Congress of Paris in 1856 but, run by the government, it was presumably respectable), the money for them being made available by the scrapping of the redundant battle fleet and its expensive infrastructure. A number of commerce-raiding cruisers were constructed but, by the end of the century, it was obvious that war was now far more likely with the Triple Alliance than with the UK and Aube's influence waned. It was at this point that the *Jurien* was built.

Of virtually the same length as the 'Gueydons', she was nearly 5 m (16.4 ft) smaller in the beam, a considerable amount that called for a lighter and lower superstructure in compensation, with poles in place of military masts. Further topside weight was saved by lighter calibre guns and use of casemates rather than sided turrets. There was no belt, the volume beneath the waterline being covered by a 65-mm (2.56-in) protective deck and flanked by cellular sub-division. Though having less installed power than the larger ships, her finer lines and lighter displacement were supposed to realize 23 kts. This speed was never achieved. As with most French cruisers in the war, her potential was under-utilized, the *Jurien* being employed primarily in containing a largely quiescent Austrian fleet in the Adria-



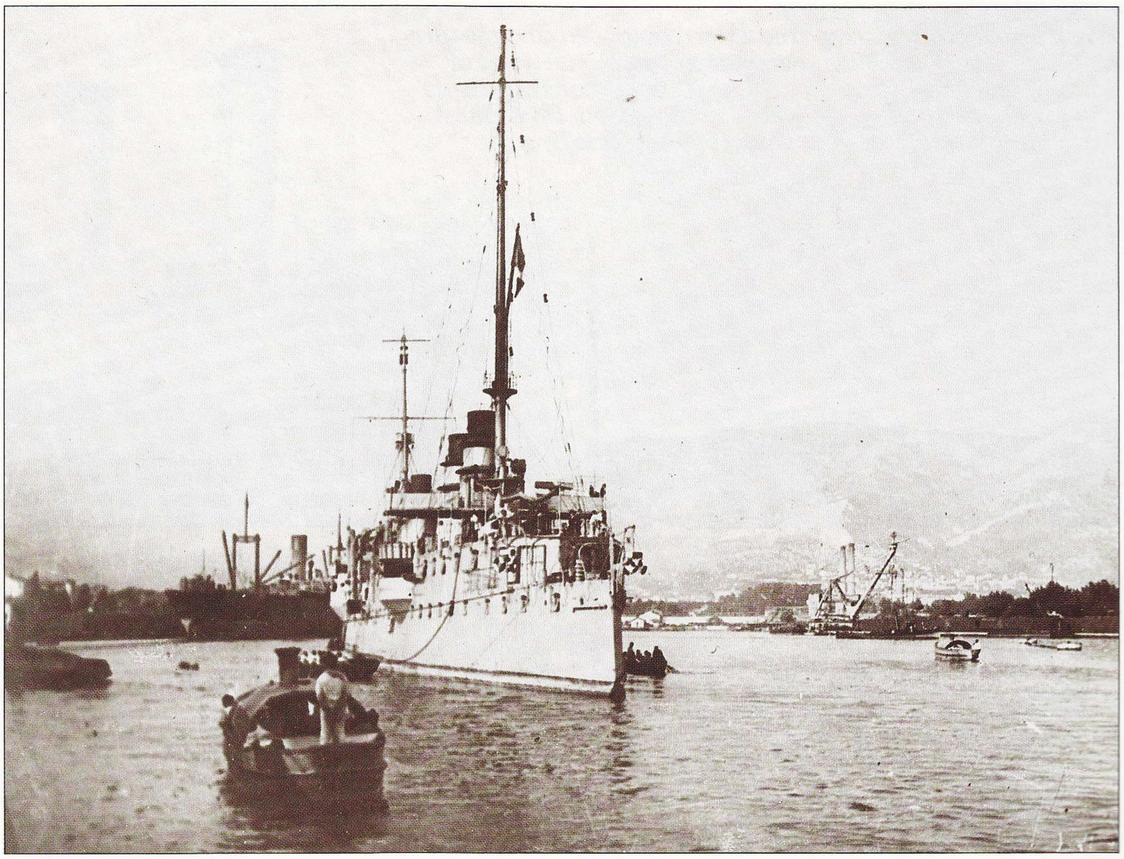
Despairing of defeating the British battle fleet, the French planned a series of fast light cruisers to attack merchant shipping, even building one, Chateaurenault, *to look like a liner.* Jurien de la Gravière *was a failure; designed for 23 kts, she never managed more than 21, and that only for an hour or so.*

tic and in minor operations with the British in Greek and Turkish waters.

Specification

Jurien de la Gravière

Displacement: 5,650 tons standard
Dimensions: length 137.0 m (449.5 ft); beam 15.0 m (49.2 ft); draught 6.4 m (21.0 ft)
Propulsion: three sets of triple-expansion steam engines delivering 17,000 ihp (12675 kW) to three shafts
Speed: 22 kts
Endurance: 1150 km (7,145 miles) at 10 kts
Armament: two twin and four single 164-mm (6.4-in) and 10 single 47-mm guns, and two 450-mm (17.7-in) torpedo tubes
Armour: 65-mm (2.56-in) deck and 50-mm (1.98-in) gunhouses and casemates
Complement: 511



Jurien de la Gravière *was designed as a commerce raider, her intended victims British merchantmen, but* détente *between Great Britain and France left her without a role. She is seen here entering Toulon for a refit in September 1916.*

ITALY

'Quarto' class

Italian fleet operations have always been limited largely by the confines of the Mediterranean; this has combined with close rivalry with the neighbouring French to exert great influence on their warship design over the years. Typically, endurance and protection have been subordinated to speed and armament. Like other fleets before 1914, the Italians flirted with the idea of the scout cruiser once the steam turbine and oil-firing were available to produce sufficient power in a small hull. Unusually, where this beginning might well have been expected to result in a series of ever larger classes, the Italians initially progressed downward to the large destroyer and, though the difference was fine, this was recognized in the categorization of *esploratori* rather than *incrocitori leggeri*.

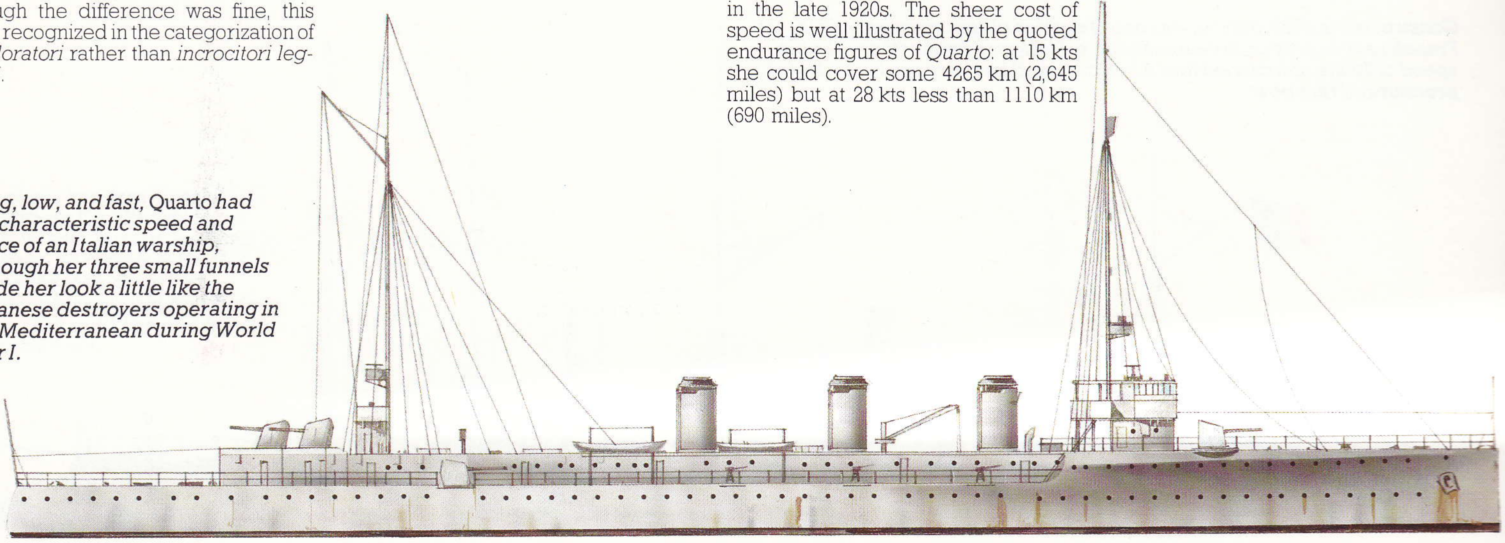
Typical of ships built in the age of the reciprocating engine were the two 1,300-ton 'Agordats' which, as scouts, were poorly served by their 22 kts and, when the ***Quarto*** was completed in 1913, she marked something of a revolution. Of about the same size as the earlier British scouts, her later machinery permitted a maximum of over 29,000 shp (21620 kW) on four shafts, resulting in a trial speed of nearly 29 kts. Her turbines were of Parsons manufacture and were reliable throughout her comparatively long career (she was not finally stricken until 1939). Long and low with a raised forecastle, she was a classic scout, her three low but evenly sized and spaced funnels imparting a somewhat Japanese appearance.

Before *Quarto* was even launched, however, and obviously not appreciating her excellent design, the Italians laid down two 'improved' and enlarged versions, the ***Marsala*** and ***Nino Bixio***. These had lower installed power and were triple-screwed, yet still contrived four funnels which were oddly spaced and, together with the masts, given a pronounced rake. Their more Italianate appearance was not matched by performance, however, their Curtiss machinery typically producing power for about 3 kts less than the *Quarto*, and they were discarded in the late 1920s. The sheer cost of speed is well illustrated by the quoted endurance figures of *Quarto*: at 15 kts she could cover some 4265 km (2,645 miles) but at 28 kts less than 1110 km (690 miles).

Specification

'Quarto' class

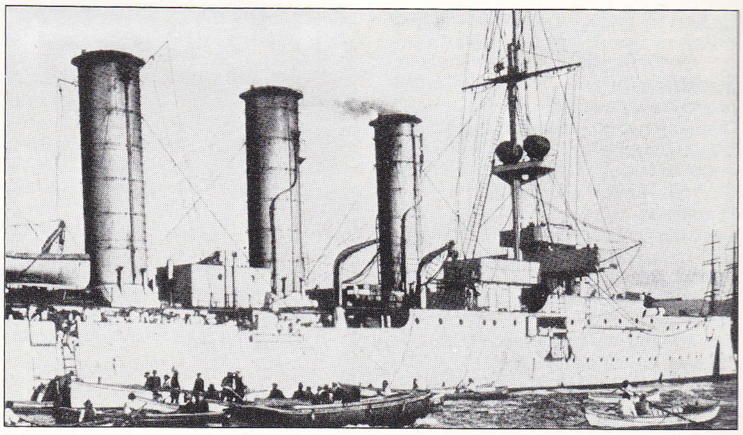
Displacement: 3,275 tons standard and 3,450 tons full load
Dimensions: length 131.6 m (431.8 ft); beam 12.9 m (42.3 ft); draught 4.1 m (13.4 ft)
Propulsion: four sets of steam turbines delivering 25,000 shp (18640 kW) to four shafts
Speed: 28.5 kts
Armament: six single 120-mm (4.7-in) and six single 76-mm (3-in) guns, two 450-mm (17.7-in) torpedo tubes, and up to 200 mines
Armour: 40-mm (1.57-in) and 20-mm (0.79-in) decks
Complement: 247



Long, low, and fast, Quarto *had the characteristic speed and grace of an Italian warship, although her three small funnels made her look a little like the Japanese destroyers operating in the Mediterranean during World War I.*

Piercing the Fog

Warship construction progressed so rapidly around the turn of the century that the distinctions between some types of warship became blurred, and whole generations of vessels were rendered obsolete at a disturbing speed. 1914 found warships of widely varying ability serving side by side.



SMS Dresden *at Valparaiso after the Battle of Coronel. She joined von Spee in the Pacific after an ineffectual commerce raid in the South Atlantic, and achieved little after escaping from the Falklands battle. The ship may have been the same class as* Emden, *but the crew were not.*

Many categories of warship were, and indeed remain, difficult to label in absolute terms: in this respect the light cruiser is typical. From the Washington Treaty of the early 1920s it was simply a cruiser with guns of 152-mm (6-in) calibre or less, an over-simplification that led, by 1945, to a band that ranged from the 14,700-ton American 'Worcesters' at the top end to the little 3,750-ton Italian 'Capitani Romani' at the lower. Where the functions of these similarly-labelled classes were greatly different so, too, were those of ships of the generation before. 'Light' meant at this time not 'small' so much as 'fast', thus necessarily also meaning 'lightly protected' and 'lightly armed', with functions of either commerce destruction or scouting.

Small cruising ships for colonial use aside, mainstream cruiser development in the transitional era was directed to producing something akin to a derated battleship, a type short-lived as a consequence of its inferior characteristics, resulting from the enormous weight of its protection and the low power of its machinery. In order to be faster than the main body of the fleet, the cruiser was obliged to abandon its massive vertical belt and rely on a combination of horizontal armour laid over a closely-subdivided lower level.

This, the so-called 'protected cruiser', enjoyed a vogue until the advent of face-hardened steel armour, which offered greatly increased resistance to penetration on a reduced thickness and weight. This development brought about a renaissance of the armoured cruiser, whose brief reign was then terminated abruptly by the arrival of the battle-cruiser in 1907. Improved machinery and new quick-firing guns enabled the protected cruiser to survive this decade. Small second- and third-class cruisers patrolled the imperial trade routes, joined by the two 'Powerfuls', a leap in size and hopelessly uneconomic but necessary as a riposte to French and Russian essays in commerce-raiders.

The trend to lighter protection was one followed very warily by the British Admiralty, but a new influence during the 1890s was the so-called torpedo gunboat. Whether foreign or British, this type proved too slow and unequal to its designed role, but its ships proved adequate as leaders to the large flotillas of small torpedo boat destroyers then coming into service.

German scouts

To the Royal Navy scouting was a service to the main battle fleet and was a job for armoured cruisers, but fleets with smaller budgets needed to be more innovative and, in 1900, the Germans built the little 25-kt *Novik* to Russian account. The inevitable British response were the four 'Gems' of about the same size, but slower (significantly, one heralded a new era in being powered by steam turbines). They had only minimal protective deck but, in parallel, were produced eight 'Scouts' using four leading builders to interpret a specification with a fair degree of freedom, resulting in a selection of comparisons on how to work in light protection on a very tight displacement limit. Despite their name, these little ships were rapidly put to use as destroyer leaders.

Destroyers of the time were fragile things and were commonly organized into flotillas of upwards of 20 ships. Their operation was the business of a Captain (D) who, with his staff, needed a larger ship not only to provide the necessary accommodation but also to guarantee keeping pace with the pack in poor conditions. These early ships were armed only with 102-mm (4-in) guns but these matched, in calibre at least, the 105-mm (4.13-in) weapons favoured in the Kaiser's developing fleet and were, in any case, adequate to disable an enemy destroyer in support of their own. Destroyers were rapidly increasing in size and capability, however, and larger leaders were soon found to be necessary.

With the supersession of the armoured cruiser in 1907, the British began on a long series of 'Towns' which, like the sailing frigate, could find, track and report for the main body of the fleet, while having the speed to avoid apprehension. That such evasion of action was unpopular was evidenced by the reception given to the early proposals to fit 4-in gunned light cruisers with a pair of 6-in weapons aft to deter pursuing enemies! In the event, the 6-in gun had been accepted as standard in the Royal Navy by 1914, and early experience of its extra hitting power soon persuaded the Germans to follow suit. But this type of cruiser was largely ignored elsewhere, except perhaps Japan.

While (with the exception of the two 'Brummers') the German fleet stuck only a developing series of their own 'Towns', the British continued also with the smaller ships, their task eased by the early adoption of steam turbines and oil firing. These classes moved logically through the 'Arethusas' to a series of 'Cs' and 'Ds', their size seeing them employed as 'attached' cruisers to the Grand Fleet battle squadrons or co-operating closely with destroyer flotillas, as at Harwich.

Togo had made classic use of cruisers during the Russo-Japanese War of 1904-5, particularly in shepherding Rozhdestvensky's fleet to its doom at Tsushima, but this gave little indication of how the British and Germans would use their considerable numbers after 1914.

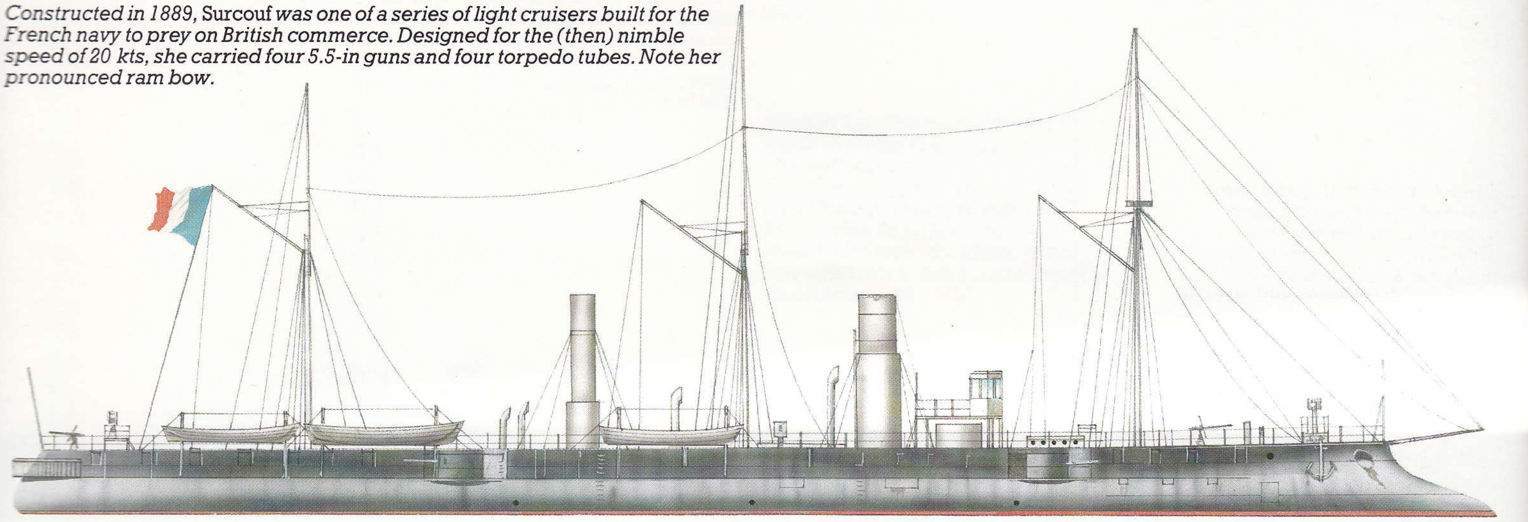
Half a dozen Germans were on distant stations and, despite early successes, their ultimate destruction was virtually certain. Some British light cruisers found themselves in early days involved in hunting raiders both in the Indian Ocean and off South America but, for the most part, they were occupied in attritional warfare in home waters.

Of the war's major engagements, Coronel, the Falklands and the Heligoland Bight hinged largely on cruiser performance, while at both the Dogger Bank and Jutland initial contact was gained by light cruiser screens, reconnoitering ahead of their main forces.

The ships of both fleets proved remarkably resistant to gunfire, losses being dominated by casualties to mine and submarine torpedo. Even in the North Sea, conditions could be cold enough to cause gun mechanisms to jam. Open, single mountings were used throughout the war, and only with the 'E' type stretched versions of the 'Ds' did the prototype twin gun-house make its appearance.

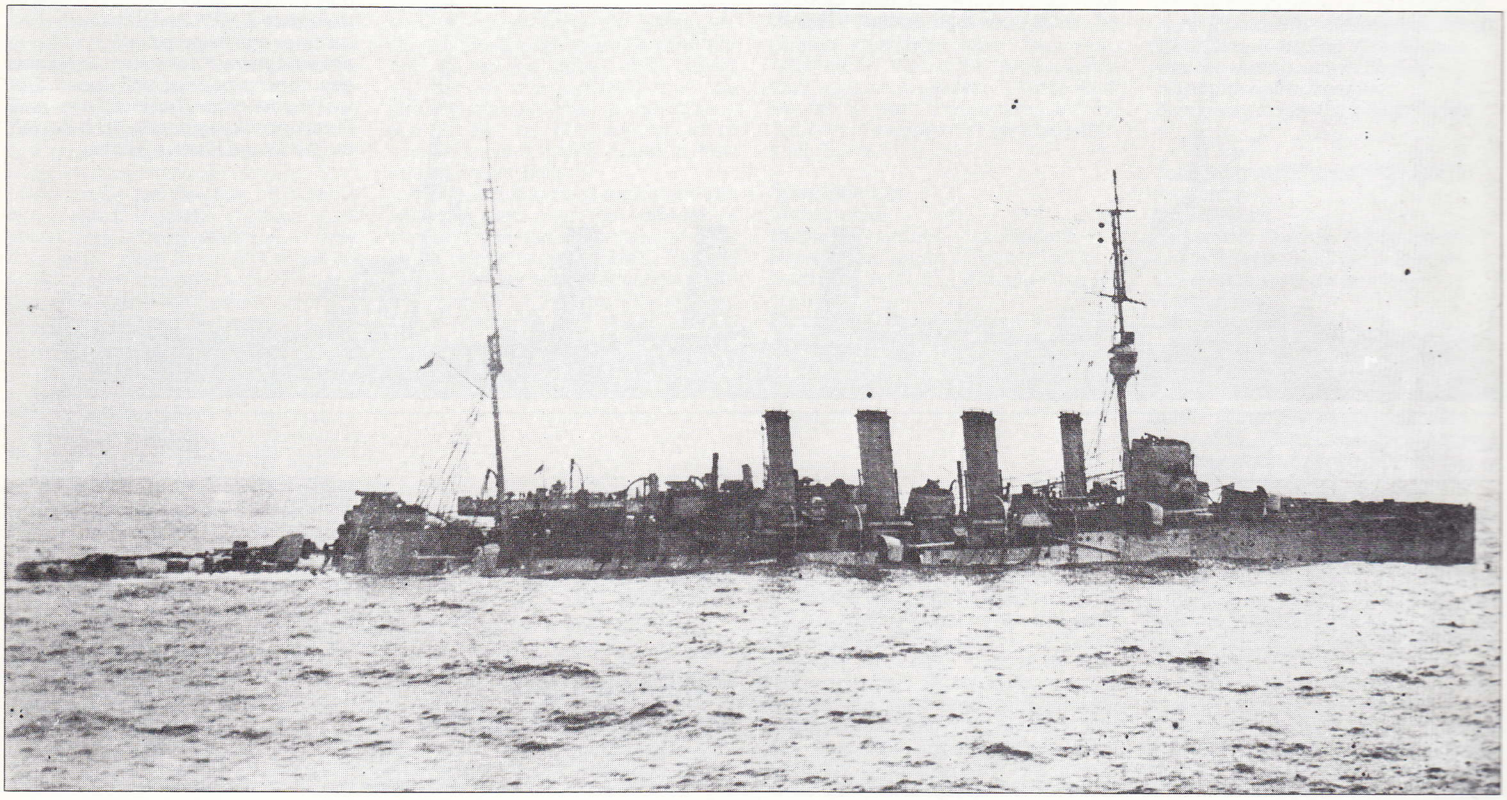
Torpedoes were carried by all classes of both sides yet, as in other types of vessel, there was generally a curious lack of result in their use. This may well have been due to the expense of the weapon militating against adequate practice and, if history can be held to teach lessons relevant to our own times, this bodes ill for the current heavy reliance on missiles.

Constructed in 1889, Surcouf *was one of a series of light cruisers built for the French navy to prey on British commerce. Designed for the (then) nimble speed of 20 kts, she carried four 5.5-in guns and four torpedo tubes. Note her pronounced ram bow.*

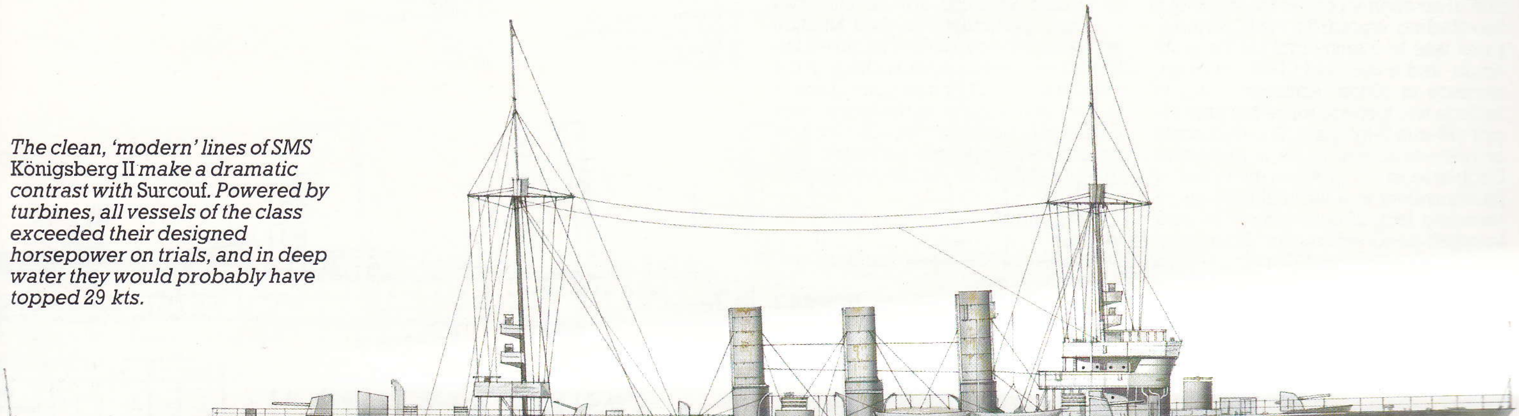


Right: Well wrapped up against the Baltic cold, the crew of HMS Caradoc*'s aft 6-in gun open fire on Bolshevik positions in the Baltic. Light cruisers carried their main armament in single open mountings throughout the war, despite instances of the cold jamming the guns.*

Below: Flagship of the 3rd Light Cruiser Squadron, HMS Falmouth *was scouting ahead of the Grand Fleet in August 1916 when she was torpedoed by* U 66*. Taken under tow, she reached Flamborough Head only to be torpedoed again by* U 52*. Here she settles in the water the next day.*



The clean, 'modern' lines of SMS Königsberg II *make a dramatic contrast with* Surcouf*. Powered by turbines, all vessels of the class exceeded their designed horsepower on trials, and in deep water they would probably have topped 29 kts.*



UK

'Gem' class

Though strictly protected cruisers, the 'Gem' class ships (HMS ***Amethyst, Diamond, Sapphire*** and ***Topaze***) mark the point of departure for the light cruiser in the Royal Navy. Protected cruisers relied primarily on an arched armoured deck, running the full length of the ship, below the waterline at each end but higher amidships to clear the top of the high reciprocating engines and boilers. Such ships came in a variety of sizes but, like the armoured cruisers, possessed too little (if any) speed margin over the fleet's main body with which to act as scouts. The four 'Gems', launched in 1903-4, were built in parallel with the two 'Challengers' but, where the latter displaced 5,900 tons on a 145 by 17.1 m (376 by 56 ft) hull, the 'Gems' on virtually the same length displaced only 3,000 tons by virtue of a slender 12.2-m (40-ft) beam. The 'Challengers' had a slightly heavier deck but needed 12,500 ihp (9320 kW) to make 21 kts while the 'Gems' could manage 22 kts on only 9,800 ihp (7310 kW). More significantly, one of their number, *Amethyst*, was the first smaller ship to be fitted with steam turbines. By fitting her with cruising, in addition to main, turbines, Parsons nearly overcame the machinery's greatest weakness, an economy inferior to that of reciprocating engines at lower speed. Even so, comparative trials against the similar-hulled *Topaze* saw the turbine ship consuming 1315 kg (2,900 lb) of coal per hour at 10 kts against the *Topaze*'s 1043 kg (2,300 lb). At 14 kts consumption was about equal while, at the upper end, the more compact turbines developed 12,000 hp (8945 kW) compared with 9,800 hp (7305 kW) for only 11068 kg (24,400 lb) per hour against 11839 kg (26,100 lb). Thus the lighter machinery for a three per cent greater economy produced power for an extra 1.5 kts.

These slender little ships were also armed only with 102-mm (4-in) guns (possibly influenced by German cruisers with the superior 105-mm (4.13-in) gun, a much-criticized move. Though not officially described as 'scouts', the 'Gems' closely paralleled the first scout-type cruisers then also being built, which sacrificed armament and some protection to accommodate machinery for 25 kts. *Sapphire* was very active in the Dardanelles campaign and to *Topaze* and *Diamond*, as 'attached cruisers', fell the melancholy task of rescuing the few survivors of the battleship HMS *Formidable* off Portland at the turn of the year in 1914. No 'Gems' were lost.

Specification
'Gem' class

Displacement: 3,000 tons standard

Dimensions: length 114.0 m (374.0 ft); beam 12.2 m (40.0 ft); draught 4.4 m (14.5 ft)

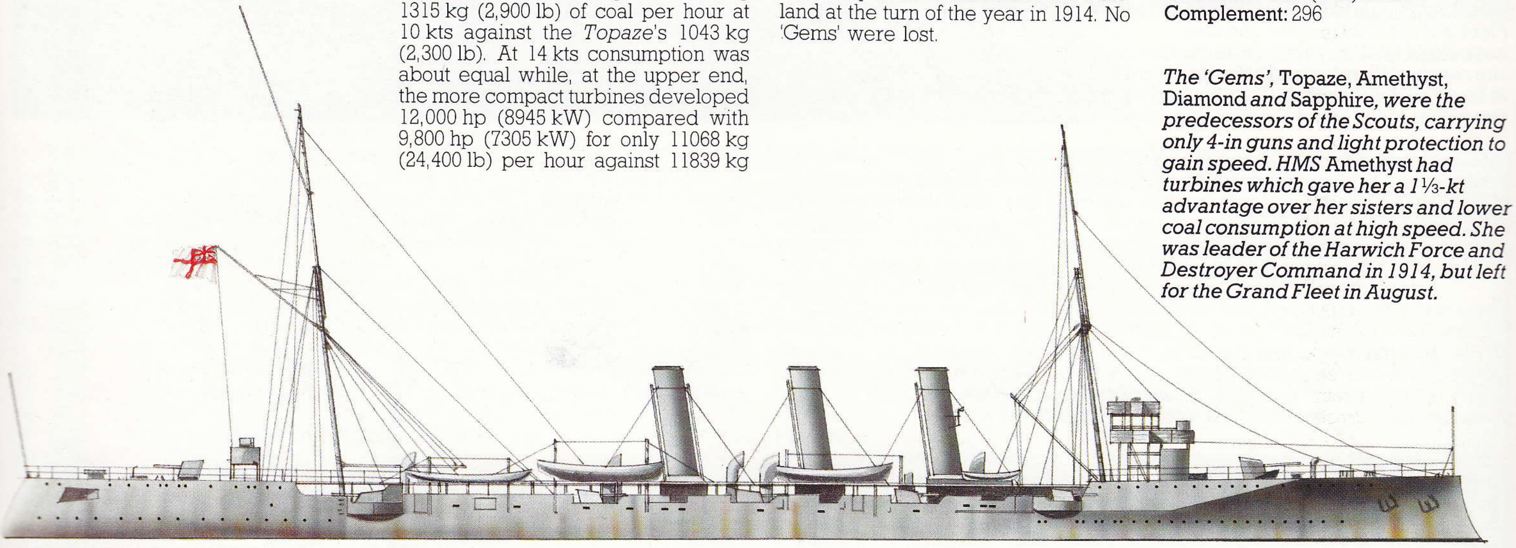
Propulsion: two sets of triple-expansion steam engines delivering 10,000 ihp (7455 kW) to two shafts, or (*Amethyst*) two sets of geared steam turbines delivering 12,000 shp (8945 kW) to two shafts

Speed: 22 kts or (*Amethyst*) 23.5 kts

Armament: 12 single 102-mm (4-in) and eight single 3-pdr guns (later altered to two single 152-mm/6-in and eight 102-mm guns), and two 457-mm (18-in) torpedo tubes

Armour: 51-mm (2-in) deck

Complement: 296



The 'Gems', Topaze, Amethyst, Diamond *and* Sapphire, *were the predecessors of the Scouts, carrying only 4-in guns and light protection to gain speed. HMS* Amethyst *had turbines which gave her a 1⅓-kt advantage over her sisters and lower coal consumption at high speed. She was leader of the Harwich Force and Destroyer Command in 1914, but left for the Grand Fleet in August.*

UK

Scout types

Like the 'largest gun' on the 'highest speed', the idea of the 'fast scout' was firmly entrenched and, though of questionable worth, was resurrected by naval staffs from time to time to plague the naval architect. British involvement probably stemmed from the classic urge to 'reply' to any foreign lead. In this case it was the *Novik*, a 3,000-tonner built in Germany to Russian account, which inspired Elswick to offer a similar but enlarged design to the Admiralty. Impressed by the 26-kt Russian, this authority put out a general specification for a small, fast cruiser that could serve for the safe observation of an enemy port as the 'eyes' of a blockading squadron. The requirement was to maintain 25 kts for eight hours, and a 5560-km (3,450-mile) endurance at 10 kts. Armament was to include two torpedo tubes but only 12-pdr (76-mm/3-in) guns. The light scale of protection was to be a protective deck 'at least 1½ inches in thickness' or its equivalent in a vertical belt, an interesting lack of commitment in context with designed function. Four proposals were accepted, a pair of ships being built by each of Armstrong (Elswick), Fairfield, Laird and Vickers, all of them being completed in 1905.

On a light displacement limit, all looked low and lean, with single, sided torpedo tubes three-quarters aft, four 12-pdr guns along each side and one more forward and aft. These were later up-rated to nine 102-mm (4-in) weapons. All had raised forecastles and the two **'F' class** ships from Fairfield had a poop in addition. Only the two **'A' class** ships from Armstrong had four funnels, the remainder three. Both the Fairfield ships and the two **'P' class** ships from Laird worked in a 51-mm (2-in) vertical patch in addition to a light protective deck. The last pair comprised the two **'S' class** ships from Vickers. An unusual feature at the time was a single, tall mast. All averaged over 25 kts over an eight-hour full-power trial, HMS *Attentive* maintaining 26.25 kts for an hour, well up to destroyer speeds of the time and a record for a ship of her size. Their cost of around £275,000 apiece attracted criticism, particularly as their function was seen to be capable of being equally well performed by destroyers in the narrow seas and by merchant cruisers in the open oceans. In the event, they performed admirably attached to line squadrons or as flotilla leaders to destroyers. Only HMS *Pathfinder* was lost.

Specification
'A' class

Displacement: 2,670 tons standard and 2,940 tons full load

Dimensions: length 114.0 m (374.0 ft); beam 11.7 m (38.25 ft); draught 4.1 m (13.5 ft)

Propulsion: two sets of triple-expansions team engines delivering 16,000 ihp (11930 kW) to two shafts

Speed: 25.5 kts

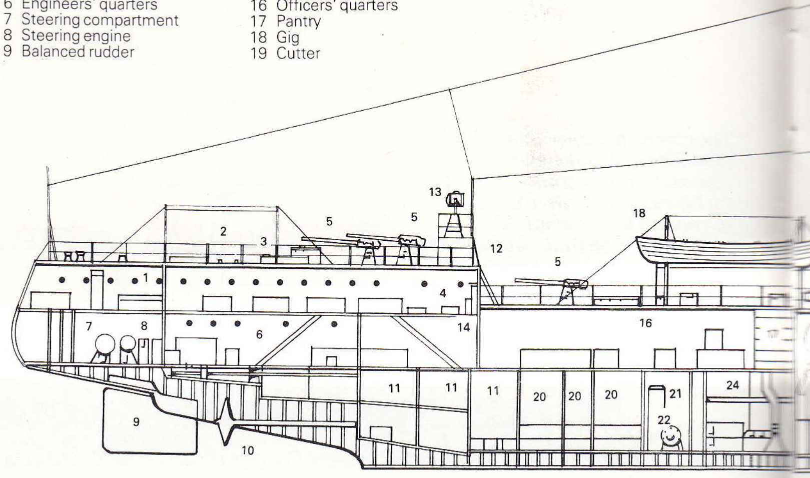
Armament: 10 single 12-pdr and eight single 3-pdr guns (later altered to nine single 102-mm/4-in and one 76-mm/3-in guns), and two 457-mm (18-in) torpedo tubes

Armour: 51-mm (2-in) deck

Complement: 270

HMS *Foresight* cutaway drawing key

1 Captain's quarters
2 Quarterdeck
3 Skylight
4 Wardroom
5 12-pdr (28-cwt) quick-firing gun
6 Engineers' quarters
7 Steering compartment
8 Steering engine
9 Balanced rudder
10 Twin screws
11 12-pdr shell room
12 Searchlight platform
13 Searchlight
14 Stove
15 Flag locker
16 Officers' quarters
17 Pantry
18 Gig
19 Cutter
20 Magazine
21 Dynamo room
22 Dynamo room
23 Double bottom
24 Auxiliary engine room
25 Twin 14-in Mk XI torpedo tubes
26 Main feedwater tank
27 Engine room
28 15,800 hp twin six-cylinder engines
29 Store
30 3-pdr quick-firing guns
31 Funnel
32 Steam pipe
33 Funnel casing
34 Super heaters
35 Funnel uptake
36 No. 1 boiler room
37 No. 2 boiler room
38 No. 3 boiler room



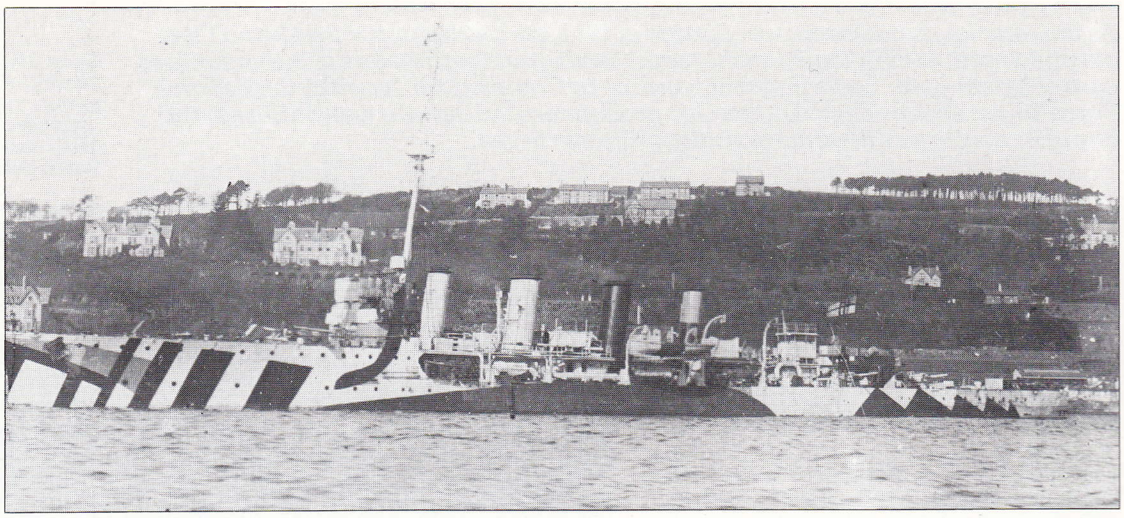
UK

'Active' class

Following the completion of the first eight scouts, there was a period of appraisal. This was a time of rapid German building and they had just completed SMS *Bremen*, the first of a new 'light cruiser' type derived, like the British ships, from the small protected cruiser. Similar in length but beamier, the German ships had the advantage of continuous high freeboard and their influence resulted eventually in the British 'Towns'. The Admiralty decided to develop the smaller cruiser further in parallel, however: not only could such ships maintain their speed longer than a destroyer in deteriorating weather, but they had the firepower to dispose of it. Further, the large destroyer flotillas of the time needed a leader with accommodation for Captain (D) and his staff. These, then, rather than scouting, became their roles.

The ships of the second, extended series of small cruisers were thus not termed 'scouts' and were constructed, not by private yards, but by Pembroke Dockyard. This single small yard did well to complete the four 'Boadiceas' in 1909-11 and the three follow-on **'Active' class** ships (HMS ***Active***, ***Amphion*** and ***Fearless***) in 1912-3. The first pair, though given 102-mm (4-in) guns, received only six of them. Only three could fire on the broadside, which was inadequate to sink a small target from a lively platform, so later ships were given 10 guns, of which six could fire on the broadside. The first two units had a light protective deck but the remainder had what was described as a 'double skin' amidships: vertical, spaced plating to defeat sensitively-fused projectiles. All were turbine-driven and carried dual coal/oil ful: the oil was sprayed onto the already burning coal in the furnace and, at the cost of rather too much smoke, gave a rapid boost in heat energy to the boiler.

While *Amphion* was mined and lost only two days after the outbreak of war, the reminder survived despite being very actively involved. The four 'Boadiceas' served as 'attached cruisers' to each of the four Grand Fleet battle squadrons and the three 'Actives' as leaders to three of the four Grand Fleet destroyer flotillas, an arduous duty from which they were relieved by the larger 'Arethusas' as they became available. Of these flotillas, the 1st with 20 destroyers and the 3rd with 15 were part of Tyrwhitt's Harwich Force.



HMS Active *cruises off Queenstown in 1917 before her deployment to the Mediterranean. The 'Active' class was the third group of Scouts, distinguishable from its predecessors by the plough bows.*

Specification

'Active' class

Displacement: 3,440 tons standard

Dimensions: length 123.4 m (405.0 ft); beam 12.6 m (41.5 ft); draught 4.0 m (13.0 ft)

Propulsion: two sets of steam turbines delivering 18,000 shp (13420 kW) to two shafts

Speed: 26 kts

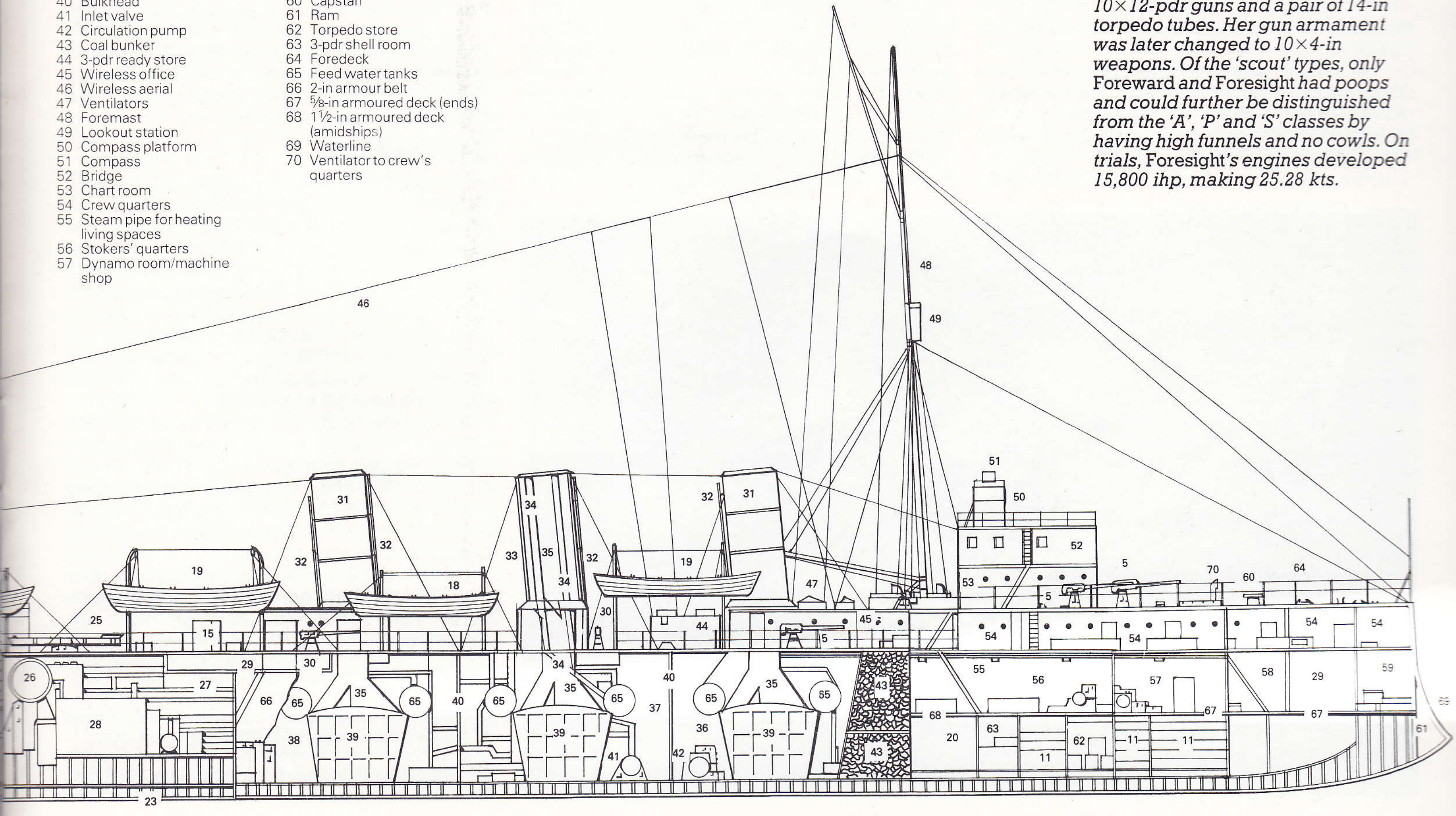
Armament: 10 single 102-mm (4-in) and four single 3-pdr guns, and two 533-mm (21-in) torpedo tubes

Armour: none

Complement: 320

39	Three-quarter White-Forster cylindrical boiler
40	Bulkhead
41	Inlet valve
42	Circulation pump
43	Coal bunker
44	3-pdr ready store
45	Wireless office
46	Wireless aerial
47	Ventilators
48	Foremast
49	Lookout station
50	Compass platform
51	Compass
52	Bridge
53	Chart room
54	Crew quarters
55	Steam pipe for heating living spaces
56	Stokers' quarters
57	Dynamo room/machine shop
58	Lobby
59	Paint store
60	Capstan
61	Ram
62	Torpedo store
63	3-pdr shell room
64	Foredeck
65	Feed water tanks
66	2-in armour belt
67	⅝-in armoured deck (ends)
68	1½-in armoured deck (amidships)
69	Waterline
70	Ventilator to crew's quarters

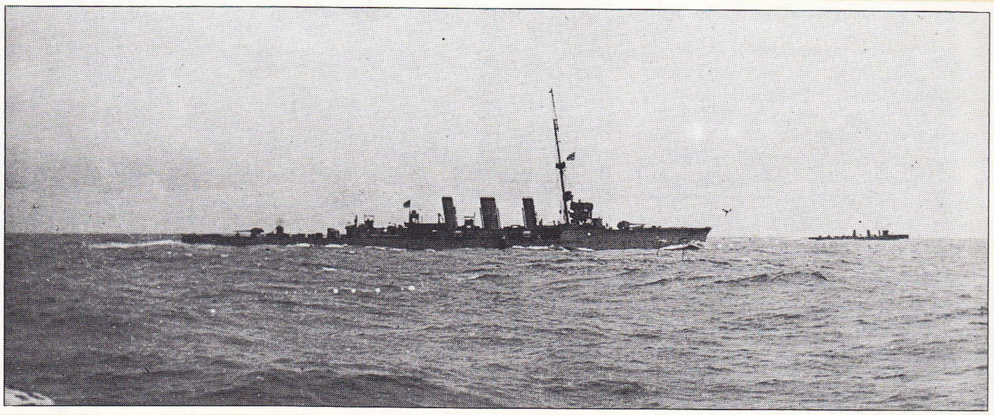
Below: When she was completed in early 1905, HMS Foresight *carried 10×12-pdr guns and a pair of 14-in torpedo tubes. Her gun armament was later changed to 10×4-in weapons. Of the 'scout' types, only* Foreward *and* Foresight *had poops and could further be distinguished from the 'A', 'P' and 'S' classes by having high funnels and no cowls. On trials,* Foresight's *engines developed 15,800 ihp, making 25.28 kts.*



At Sea Before Breakfast

As the war clouds gathered over Europe in 1914, the battleships of the Grand Fleet steamed north to their lonely anchorages, leaving southern waters in the immediate care of lighter units. Led with great panache by Commodore Tyrwhitt, the Harwich Force was in action with characteristic promptness the day war was declared, and one of its destroyers fired the first shot of the war at sea.

Below: HMS Arethusa *was commissioned in 1914 as flagship of the Harwich Force. Tyrwhitt described her as a 'regular flyer and a ripper'; she could make over 28 kts and maintained speed well in heavy seas. Together with HMS* Fearless *she led 31 British destroyers into the Bight in August.*



Following the Fleet Review of July 1914, the Royal Navy went straight to its war stations and the Harwich force was immediately established with the arrival there of the light cruiser HMS *Fearless* with 20 destroyers of the 1st Flotilla and HMS *Amphion* with the 15-strong 3rd Flotilla. They were led by Commodore Tyrwhitt, whose broad pennant was worn by HMS *Amethyst*. 'Reggie' Tyrwhitt, or Com (T) as he was invariably known from his title, was a dedicated seaman and born fighter; he was to lead the force for the duration of the war, infusing it with enormous enthusiasm.

Though intended to be a southern wing of the Grand Fleet, the Force was almost immediately taken under direct Admiralty control because of the remoteness of Jellicoe's organization. Together with the 8th Submarine Flotilla (under the command of Tyrwhitt's great friend and fellow zealot, Roger Keyes) they had the task of controlling the Hoofden, the narrow southern gullet of the North Sea. A measure of support could be called upon from the neighbouring Humber, Nore and (later) Dover commands.

Starting as he meant to continue, Tyrwhitt was at sea before breakfast on the first day of the war to counter the enemy's anticipated minelaying activities. Following up a report of a suspicious-looking packet-type ship, the German *Königin Luise* was intercepted and sunk, the destroyer HMS *Lance* firing the first shot of the sea war in the process. Honours were soon evened, however, as the *Amphion* ran on a mine on her return, sinking with considerable loss of life.

For several days offensive patrols off the Dutch coast drew a blank and the force was pulled south to cover massive troop movements across the English Channel. Even now it was obvious to Tyrwhitt that the *Amethyst*, although only 10 years old, could make only 18 kts rather than her designed 23.5. He demanded, and received, the new HMS *Arethusa* in exchange. He described her as a 'regular flyer and a ripper' and, without doubt, her 152-mm (6-in) guns and 76-mm (3-in) belt were to prove invaluable.

On 18 August the *Fearless* and four of her destroyers sighted the German cruiser SMS *Rostock* but took her for something larger, acted indecisively and lost her. Com (T), absent from the scene, was furious but more than compensated by the end of the month with his action in the Heligoland Bight.

Keyes' submarines had observed a great regularity in the German patrols, and he and Tyrwhitt proposed a raid. This was right on the enemy's doorstep and, in case of interference from his heavy units, would require support from the Grand Fleet.

Beatty's battle-cruisers and Goodenough's 1st Light Cruiser Squadron were requested and refused, only to be reinstated by Jellicoe. This latter news did not reach the Harwich Force, which had already sailed.

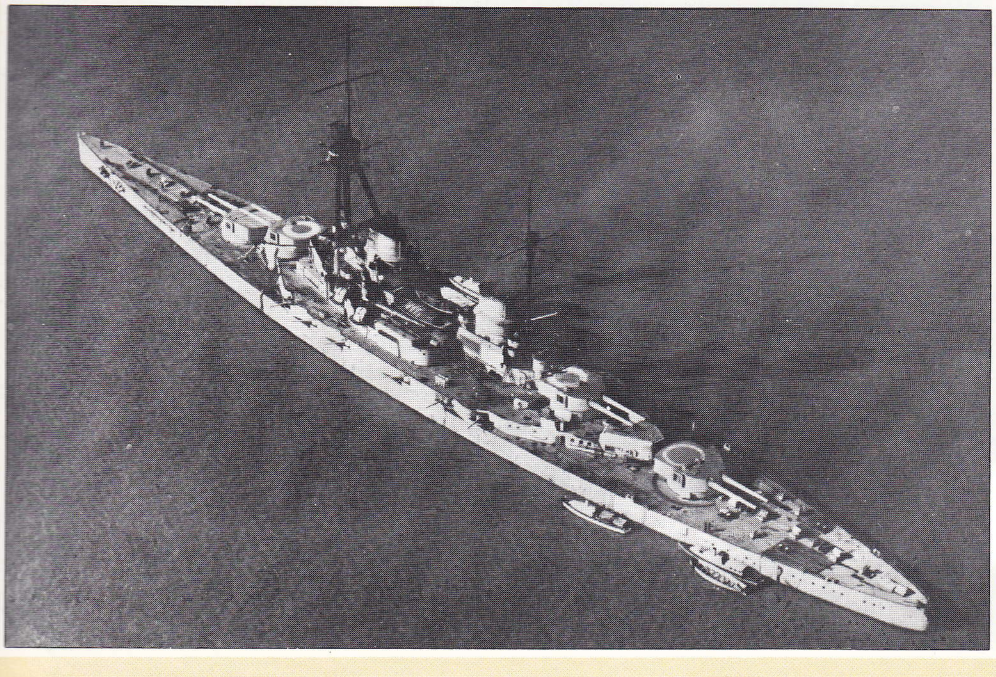
The *Arethusa* and *Fearless*, with 31 destroyers, were to sweep from the north and roll westward along the German coast, pursuing any fleeing enemy onto a submarine trap set by Keyes. The Force left early on 27 August, only one day after the commodore had accepted his new ship, and were surprised to meet Goodenough at 03.30 on the following morning. Shortly before 07.00 a German destroyer was sighted and fell back with a division of the 3rd Flotilla in joyful chase. What was not known was that the Germans had suspected such an operation and had prepared a defence in depth, with two patrol lines backed by light cruisers. *Arethusa* was soon heavily engaged with SMS *Stettin* and *Frauenlob*. The *Fearless* obliged the former to retreat but the latter soon profitted by the frequent jamming of the *Arethusa*'s new guns, inflicting a deal of damage. Only a 152-mm shell hit on her bridge persuaded the German to retire.

New challenge

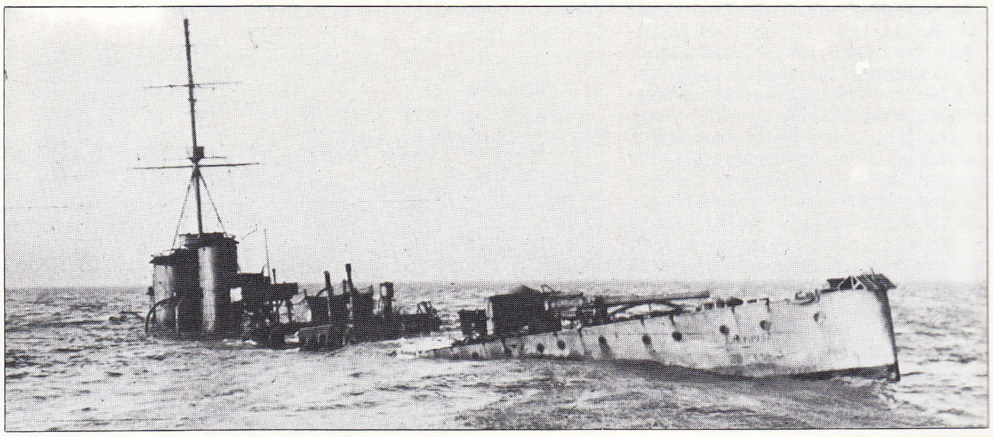
Driving westward, the enemy destroyer *V 187* was overwhelmed, but Goodenough now found himself challenged by Keyes who also had received no prior warning of his presence. *Arethusa* now found herself involved with SMS *Strassburg*, her brand new machinery all but broken down. Again the *Fearless* arrived at a critical juncture, with the *Stettin* returning with a newcomer, SMS *Mainz*. In shifting visibility and unsure of Goodenough's strength, Tyrwhitt called for Beatty's assistance.

An anxious hour passed, with the *Arethusa*'s condition looking increasingly parlous and the enemy further reinforced by SMS *Köln* and *Ariadne*. The time was spent constructively, however, for the *Mainz* despite a spirited defence was hounded to destruction by the destroyers and cruiser gunfire.

Beatty's appearance was sudden and decisive. His decision to take his irreplaceable ships into such waters was typically courageous and caught the Germans unprepared. The *Köln* was sunk and the fleeing *Stet-*



SMS Derfflinger *was one of the battle-cruisers used by the Germans to bombard Britain's east coast. One of Tyrwhitt's cruisers, HMS* Aurora, *spotted the Germans off Dogger Bank in January 1915, but muddled signalling let all but SMS* Blücher *escape.*



The North Sea was sown with mines by both sides, particularly along the British east coast, and Tyrwhitt's own ship, HMS Arethusa, *was badly damaged by one off Felixstowe on 11 February 1916. An attempt to tow her home failed, the cruiser drifting on to the Cutler Shoal and sinking.*

tin heavily damaged, while the little *Ariadne*, which blundered across the flagship's path, fairly disintegrated under 343-mm (13.5-in) salvoes at close range.

Victory had been snatched fortuitously from an untidy melee. While Beatty and Tyrwhitt were all too aware of this, they found themselves lionized by press and public.

Any ideas of the Royal Navy's invincibility on the part of the latter bodies was swiftly rectified, however, for the following month, the Harwich Force had the melancholy task of taking on the survivors of the three 'Bacchantes' sunk near the Dutch coast by that new weapon, the submarine. Very much 'chummy' ships, their loss was keenly felt. An alarmed Admiralty tried, initially, to keep Tyrwhitt's cruisers in port but then relented, giving him two more in the form of HMS *Aurora* and *Undaunted*. The latter ship was commanded by the erstwhile captain of the unfortunate *Amphion* and, on the very day of her arrival in October 1914, he took a division of destroyers on a sweep, accounting for four of the enemy's destroyers off the Texel.

A new and disturbing tactic on the part of the Germans was to use Hipper's battle-cruisers in hit-and-run bombardments of the English east coast. These raids were almost impossible to counter without prior intelligence, but a great chance was squandered at the Dogger Bank in January 1915. *Aurora* of the Harwich Force sighted the enemy and, in company with both Beatty and Goodenough, became involved in a general chase. As a result of damage, ambiguous signalling and faulty interpretation, the British allowed Hipper to escape with the loss of only SMS *Blücher*. While Tyrwhitt himself finished off the latter with torpedoes, the affair was unsatisfactory with, among other things, the light cruisers finding themselves outpaced by the battle cruisers.

Seaborne air attacks

With Zeppelins becoming an increasing bogey, the Harwich Force struck at source with the world's first seaborne air attacks. Seaplane carriers converted from cross-channel packets were escorted deep into the Bight, but their overloaded and underpowered aircraft had difficulty in getting airborne. A continuing involvement with aviation saw also the use of high-speed, destroyer-towed sleds and temporary runways on cruisers' foredecks to launch higher-performance fighters.

Between the endless sweeps, the Force was occupied in covering convoys, capturing enemy trawlers (to gain intelligence), bombardments and the escorting of minelayers. They accounted in turn for the enemy minelayer SMS *Meteor* but the heavily-fouled offshore approaches cost Tyrwhitt his own ship, *Arethusa*, in February 1916 when she was broken in two by a mine. New 'C' class cruisers were by now arriving, better able to pace the bigger 'M' class destroyers and the Force's strength at this point was eight cruisers and 23 destroyers.

In a typical operation, Tyrwhitt took a strong element close to the Danish coast, escorting the seaplane carrier HMS *Vindex* in a raid against the Zeppelin sheds at Tondern.

During a snow flurry, two destroyers collided, one, HMS *Medusa*, being capable of only 6 kts. She was taken in tow but the group was attacked by enemy destroyers. The cruiser HMS *Cleopatra* sank one by ramming, only to be hit in turn by the *Undaunted*. To retrieve this casualty meant sacrificing the *Medusa* so honours were about even.

To coincide with the 1916 Irish Easter Rebellion, Hipper mounted a battle-cruiser foray against Lowestoft and Yarmouth. Tyrwhitt, unsupported by heavy units, made contact and, in spite of his cruiser, HMS *Conquest*, being hit by several 305-mm (12-in) shells, hung on until the Admiralty ordered his disengagement.

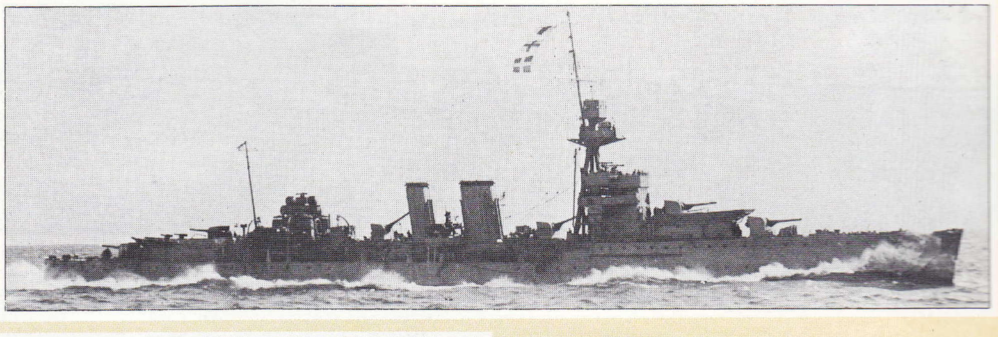
The following month saw Jutland. Against all his instincts, Tyrwhitt was held in harbour all day, awaiting orders. He was finally let off the leash but then recalled. Had the group been present during the night action, its outcome must surely have been different.

Fleet forced back

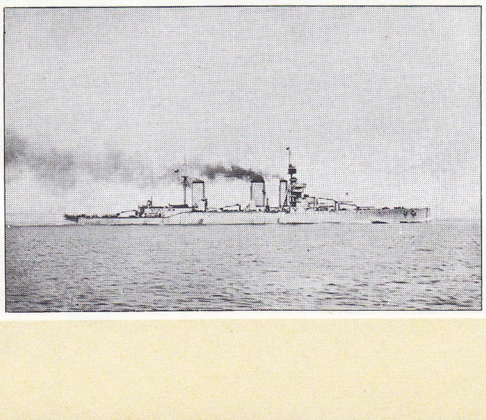
Enemy submarine activity forced back the operating limits of the Grand Fleet, and the responsibilities of the Harwich Force thus increased. They covered the 'Beef Run' from the Hook against depredations from the enemy destroyers based on Zeebrügge, forcing several vicious little engagements. They covered the endless traffic in troops and supplies across the Dover Strait and watched over the teaming and vulnerable coastal trade in what was to be known, 25 years later, as 'E-Boat Alley'. Zeebrügge and Ostende posed an endless threat, and Tyrwhitt supported bombardments by the Dover force in both May and June 1917. In the latter an enemy destroyer was caught but again the score was offset when, in the following winter, four British destroyers were mined in succession off the Hook, three sinking in icy conditions with heavy loss of life.

Again Tyrwhitt was in a supporting role at Keyes' gallant attempt to block the two ports in April 1918. Following the mining of two of his cruisers, Tyrwhitt took to transporting CMBs in the cruisers' davits. These shallow-draught boats then patrolled safely over the mines while the bigger ships lay off to recover them. The stratagem went disastrously awry when a unit of six boats was lost to German seaplane attack off Vlieland in August 1918. On the credit side, a Zeppelin was downed by a Sopwith Camel fighter launched from a destroyer-towed sled.

On 23 October 1918 the Force fought its last engagement (once again against an enemy air attack) and followed the Armistice by shepherding in the large numbers of surrendered U-boats. Over the four years of unremitting effort, it had grown to a dozen cruisers; the cost of its achievement had been two cruisers and 16 destroyers sunk.



Above: HMS Danae *was the only one of her class to see active service, joining the Harwich flotilla in the summer of 1918. Displacing nearly 6,000 tons at full load, capable of 29 kts and armed with six 6-in guns, she was a far cry from the cruisers in service in 1914.*



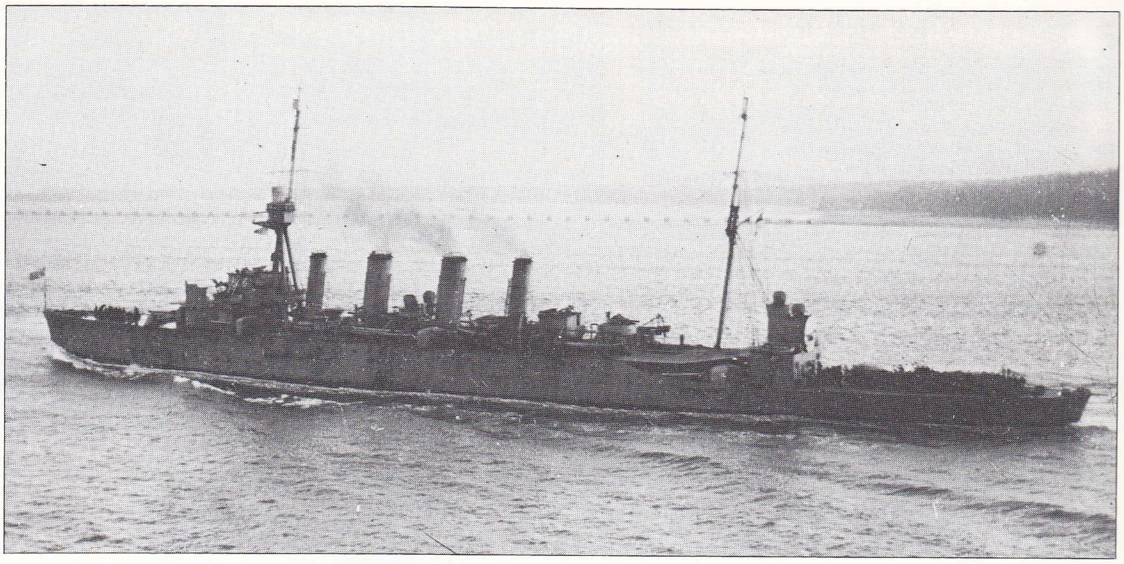
Left: Beatty's courageous decision to intervene with his battle-cruisers at Heligoland ensured the defeat of the German light forces, but it was a bold gamble to risk irreplaceable warships like HMS Lion *in enemy waters.*

UK

'Chatham' class

Contemporary with the 'Active' class, the British built a quintet of larger ships, the 'Bristols', which looked like a cross between the smaller ships and the big armoured cruisers whose construction had ceased about four years before. It had been the supersession of such ships by battle-cruisers that produced the requirements for the 'Towns', big enough to cruise with the fleet and fast enough to work ahead of it. But while armed sufficient to look after themselves, they were unable to undertake the heavier duties of the armoured cruiser.

The 4,800-ton 'Bristols' suffered again from a mixed armament, a meagre pair of 152-mm (6-in) guns being supplemented by 10 102-mm (4-in) guns. A 76-mm (3-in) protective deck was fitted. For their duties, they were criticized as being greatly underarmed, and the four 'Weymouths' that followed had an all-152-mm main battery. Their size was little increased, however, so their protection suffered, a significant loss in view of the fact that their speed had not been improved and that they could be run down by a battle-cruiser.



The six **'Chatham' class** ships (HMS ***Chatham, Dublin, Southampton, Brisbane, Melbourne*** and ***Sydney***) of 1911-12 were improved Weymouths, their eight single 152-mm mountings still not superimposed but mainly sided, so that a broadside was of only five guns. They did have a partial 76-mm belt worked in, but again enjoyed no increase in speed, the main reason for which being that they were the last of the coal-fired ships, for which the only way to produce more energy was to increase the size of the ship and install more boilers.

It is interesting to note that German light cruiser construction had followed an almost exactly parallel path, also adopting a belt at this time. In general they were slenderer, of higher power and usefully faster. Their power was absorbed by triple propellers and reflected the difficulties that the British were having in that one ship of each class was twin-screwed with the remainder quadruple. Three ships of the class served in the British Royal Navy, three in the Australian. Of the former the *Southampton* earned fame wearing Goodenough's broad pennant in a faultless performance at Jutland while, of the latter, the *Sydney* will be remembered for disposing of the raider SMS *Emden*.

Specification

'Chatham' class

Displacement: 5,400 tons standard

Dimensions: length 139.6 m (458.0 ft); beam 14.9 m (48.75 ft); draught 4.6 m (15.0 ft)

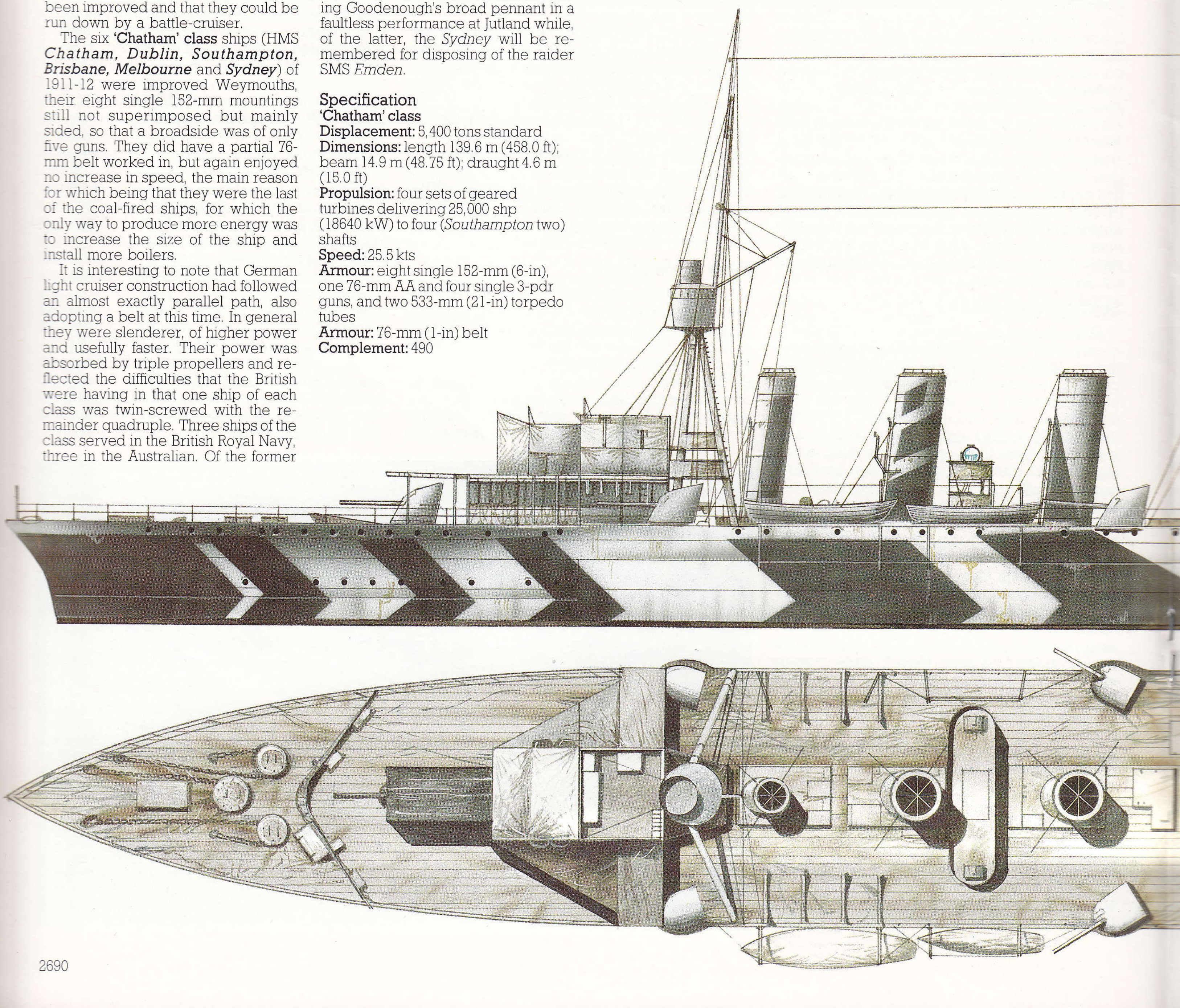
Propulsion: four sets of geared turbines delivering 25,000 shp (18640 kW) to four (*Southampton* two) shafts

Speed: 25.5 kts

Armour: eight single 152-mm (6-in), one 76-mm AA and four single 3-pdr guns, and two 533-mm (21-in) torpedo tubes

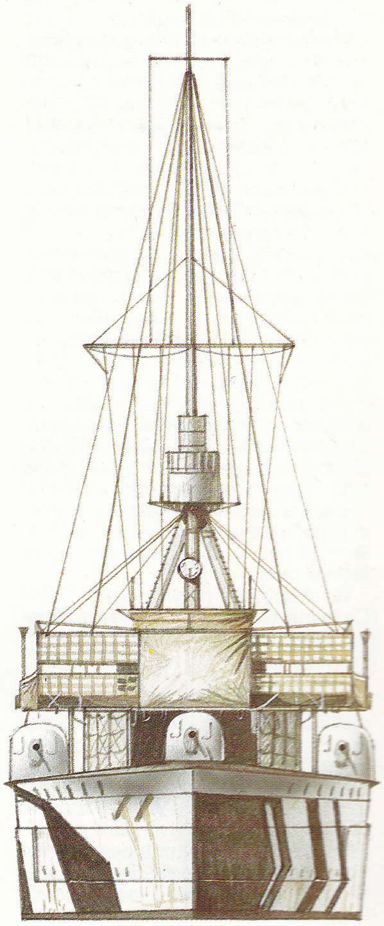
Armour: 76-mm (1-in) belt

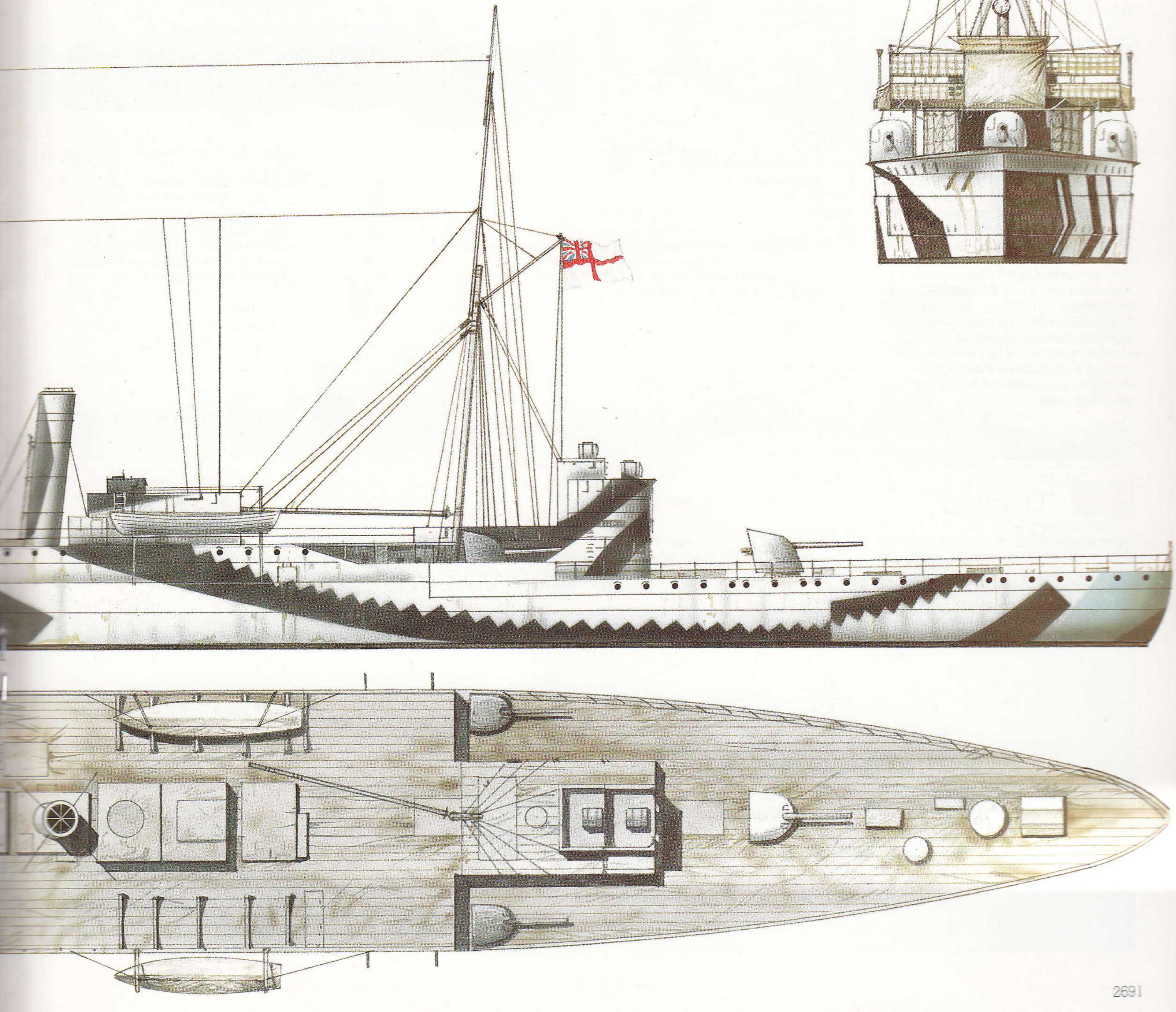
Complement: 490



Left: The mixed armament of the 'Bristol' class did not prove a success, and the 'Chathams' were armed with eight 6-in guns which gave Sydney *overwhelmingly superior broadsides in her fight with the* Emden*. Three of the class served with the Royal Navy and three with the Australian Navy.*

HMS Southampton *as she appeared in July 1919 when operating off Murmansk during the Allied intervention in Russia. The 'Chatham' class were superior sea-boats to the preceding British cruiser classes, as the forecastle was extended down more than half the length, and lower metacentric height reduced rolling. Horizontal armour was supplemented by a thin armour belt. The high velocity guns of the 'Weymouth' class had proved unsatisfactory, and the 'Chathams' mounted a new, lower-velocity 6-in gun which was considerably lighter yet could still score hits at up to 14,000 yards. After an active wartime career which included action at Heligoland, Dogger Bank and Jutland, she left Russian waters in 1919 to lead the 7th Light Cruiser Squadron in South America. After service there and at the Cape she spent 1921-4 in the East Indies before going into reserve at the Nore.*





UK

'Caroline' class

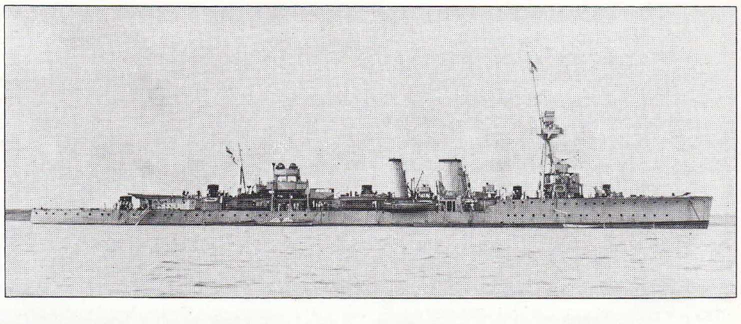
The success of the 'Actives' pointed up the advantages of a larger and higher-powered class that could better operate with the fleet main force, the 'Boadiceas', for instance, suffering badly by having to keep station on the battle squadrons in heavy weather. Higher power was now a real possibility with the rapid advances in steam turbine engineering and the eight 'Arethusas' followed in rapid succession. They were powered for 30 kts (a 120 per cent increase in shaft horsepower over the 'Actives') though their actual speeds were up to 1.5 kts slower. A major function being still seen as countering the ever-larger destroyer, they were given an oddly-mixed armament of two centreline 152-mm (6-in) guns, with eight 102-mm (4-in) weapons in single, sided mountings. They also carried a quadruple 533-mm (21-in) torpedo tube bank on either side. The extra machinery demanded a much larger hull but this was further improved by adding a 76-mm (3-in) vertical belt to the 25-mm (1-in) protective deck.

Six **'Caroline' class** cruisers (HMS ***Caroline, Carysfort, Cleopatra, Comus, Conquest*** and ***Cordelia***) then followed in quick succession, five of them from royal dockyards. A 3-m (10-ft) increase in length was of less consequence than 0.5 m (1.6 ft) extra on the beam, improving stiffness. As with the 'Arethusas', the mixed armament proved decidedly unpopular and most were re-armed with a varying number of 152-mm (6-in) guns as refits permitted. A 'first' for both classes was the inclusion of a high-angle 76- or 102-mm (3- or 4-in) gun for use against aircraft. Some earlier units were later fitted with a runway over the forecastle gun to fly off a fighter for use against the enemy's spotting Zeppelins.

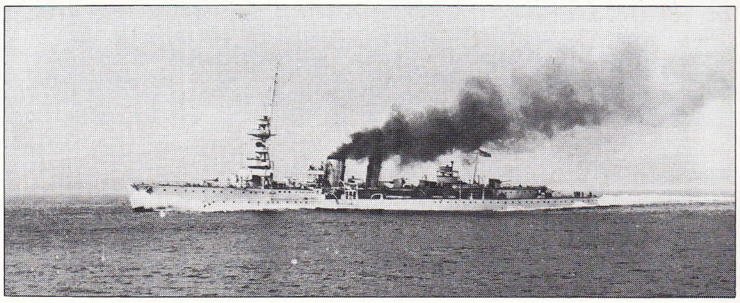
Ultimately 28 'C' class cruisers were built but, with the last completing after the war, they varied quite widely in design. All following the initial 'Carolines' had only two funnels and main armaments were rationalized to five 152-mm (6-in) centreline mountings. Later ships had guns superimposed both forward and aft, a few taking an aircraft hangar beneath the bridge. To counteract the wetness of hard driving, they were also fitted with a so-called 'trawler bow' having a knuckle and marked sheet. Thirteen went on to see service in World War II, in which six were lost. Some were used early-on in the new Northern Patrol but had to be replaced for the same reasons as the 'Talbots' in World War I.

Specification

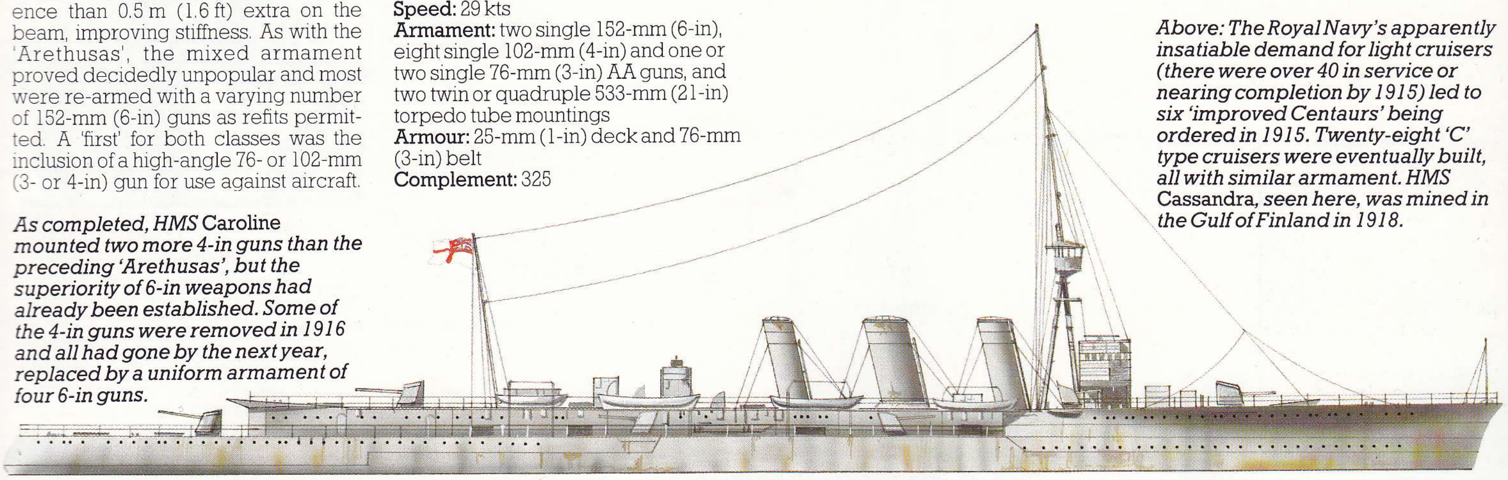
'Caroline' class
Displacement: 3,750 tons standard
Dimensions: length 135.9 m (446.0 ft); beam 12.6 m (41.5 ft); draught 4.2 m (14.0 ft)
Propulsion: four sets of geared turbines delivering 40,000 shp (29825 kW) to four shafts
Speed: 29 kts
Armament: two single 152-mm (6-in), eight single 102-mm (4-in) and one or two single 76-mm (3-in) AA guns, and two twin or quadruple 533-mm (21-in) torpedo tube mountings
Armour: 25-mm (1-in) deck and 76-mm (3-in) belt
Complement: 325



HMS Caradoc *engages Bolshevik forces in Kaffa Bay during the British intervention in Russia. On 26 December 1918, together with her sister* Calypso *and three destroyers, she captured two Bolshevik destroyers.* Caradoc *survived to serve again in World War II and was finally sold in 1946.*



Above: The Royal Navy's apparently insatiable demand for light cruisers (there were over 40 in service or nearing completion by 1915) led to six 'improved Centaurs' being ordered in 1915. Twenty-eight 'C' type cruisers were eventually built, all with similar armament. HMS Cassandra, *seen here, was mined in the Gulf of Finland in 1918.*



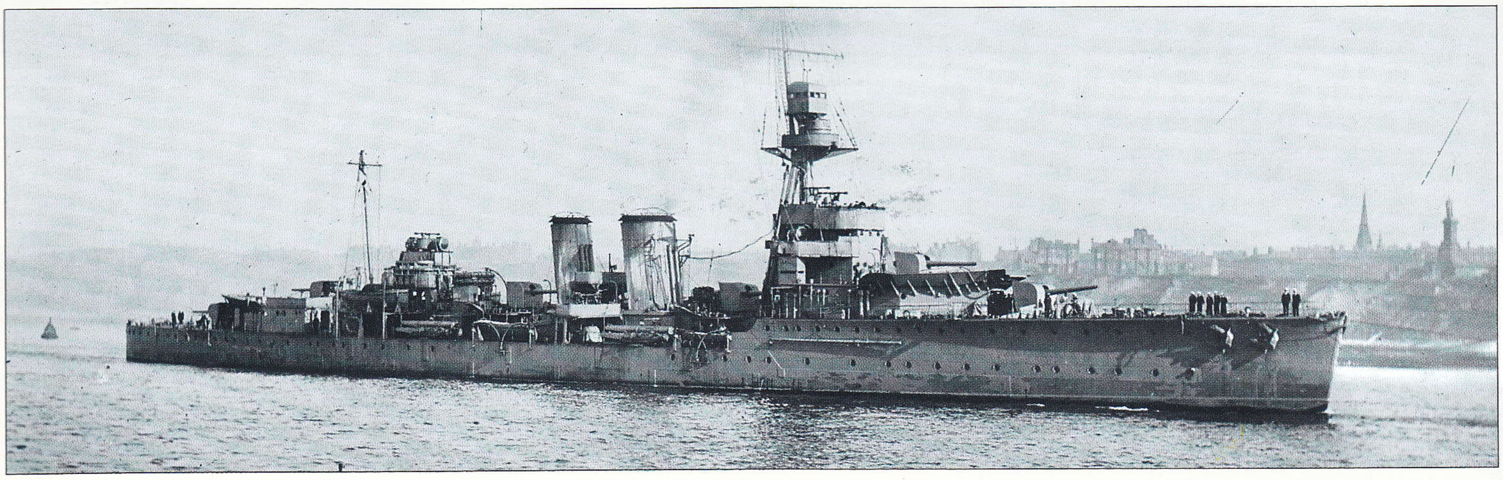
As completed, HMS Caroline *mounted two more 4-in guns than the preceding 'Arethusas', but the superiority of 6-in weapons had already been established. Some of the 4-in guns were removed in 1916 and all had gone by the next year, replaced by a uniform armament of four 6-in guns.*

UK

'D' class

Where the 'C'-type cruisers passed through several stages to reach the ultimate 'Carlisle' type, the **'D' class** ships were really the next logical step. Destroyers by the latter part of the war had advanced to the stage where they were big enough to outdistance a cruiser in all but the worst sea states

Below: Rumours that the Germans were building new and more powerful light cruisers led to the 'Danae' class mounting a sixth centreline 6-in gun and, taking advantage of the increased beam, they also mounted a heavy torpedo armament of 12×21-in weapons in four triple mountings.



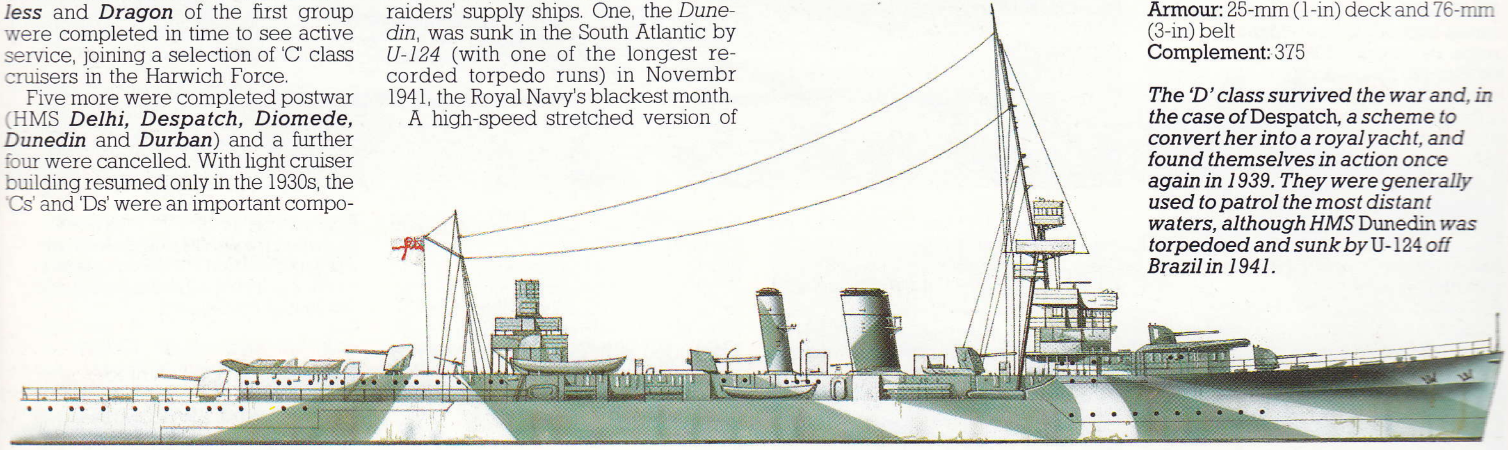
and the 'Ds' did not therefore suffer a significant increase in size to accommodate up-rated machinery. They were, however, about 6 m (20 ft) longer to take a sixth, centreline 152-mm (6-in) mounting, squeezed between the forefunnel and the bridge. As such they were the last class to take the all-single mount main battery that was extremely demanding of axial length. Advantage was also taken to double the torpedo armament to four triple mountings. Only the three **'Danae' class** units HMS ***Danae, Dauntless*** and ***Dragon*** of the first group were completed in time to see active service, joining a selection of 'C' class cruisers in the Harwich Force.

Five more were completed postwar (HMS ***Delhi, Despatch, Diomede, Dunedin*** and ***Durban***) and a further four were cancelled. With light cruiser building resumed only in the 1930s, the 'Cs' and 'Ds' were an important component of the fleet between the wars. Most of the 'Cs' that saw service in World War II had been usefully converted to AA cruisers, with the new twin HA 102-mm (4-in) mountings and the requisite fire control (though it was generally agreed that they could fire ammunition far more efficiently than they could stow it). The 'D' class ships, on the other hand, were never so converted and, being decidedly old-fashioned by 1939, were used in low-hazard duties such as patrolling the more distant trade routes or hunting raiders' supply ships. One, the *Dunedin*, was sunk in the South Atlantic by *U-124* (with one of the longest recorded torpedo runs) in Novembr 1941, the Royal Navy's blackest month.

A high-speed stretched version of the 'Ds' was started during World War I as the planned trio of 'E' class cruisers (only two were completed), doubling the machinery to achieve an astonishing 33 kts. They were completed in 1919-20. One, HMS *Enterprise*, carried a prototype twin 152-mm mounting. Both she and HMS *Emerald* had also an aircraft and catapult, and a record 16 torpedo tubes. They had the thick-and-thin funnels of the 'C' and 'D' classes, but were distinctive by having also a third funnel set well aft.

Specification

'Danae' subclass
Displacement: 4,650 tons standard
Dimensions: length 143.6 m (471.0 ft); beam 14.0 m (46.0 ft); draught 4.6 m (15.0 ft)
Propulsion: two sets of geared steam turbines delivering 40,000 shp (29825 kW) to two shafts
Speed: 28.5 kts
Armament: six single 152-mm (6-in) and two single 102-mm (4-in) AA guns, and four triple 533-mm (21-in) torpedo tube mountings
Armour: 25-mm (1-in) deck and 76-mm (3-in) belt
Complement: 375



The 'D' class survived the war and, in the case of Despatch, *a scheme to convert her into a royal yacht, and found themselves in action once again in 1939. They were generally used to patrol the most distant waters, although HMS* Dunedin *was torpedoed and sunk by* U-124 *off Brazil in 1941.*

GERMANY

'Gazelle' class

The 10 **'Gazelle' class** cruisers (SMS ***Amazone, Ariadne, Arkona, Frauenlob, Gazelle, Medusa, Niobe, Nymphe, Thetis*** and ***Undine***) bore roughly the same relationship to German light cruiser development as the 'Gem' class did to the British. They were evolved from the single SMS *Hela*, completed in 1896 (sunk by Max Horton's *E 9* a month after the outbreak of war). This ship, which was later reconstructed, was a useful prototype, limited in speed by the low rating of her cylindrical boilers, but demonstrating that a heavier armament could be shipped and that the protective deck could be uprated.

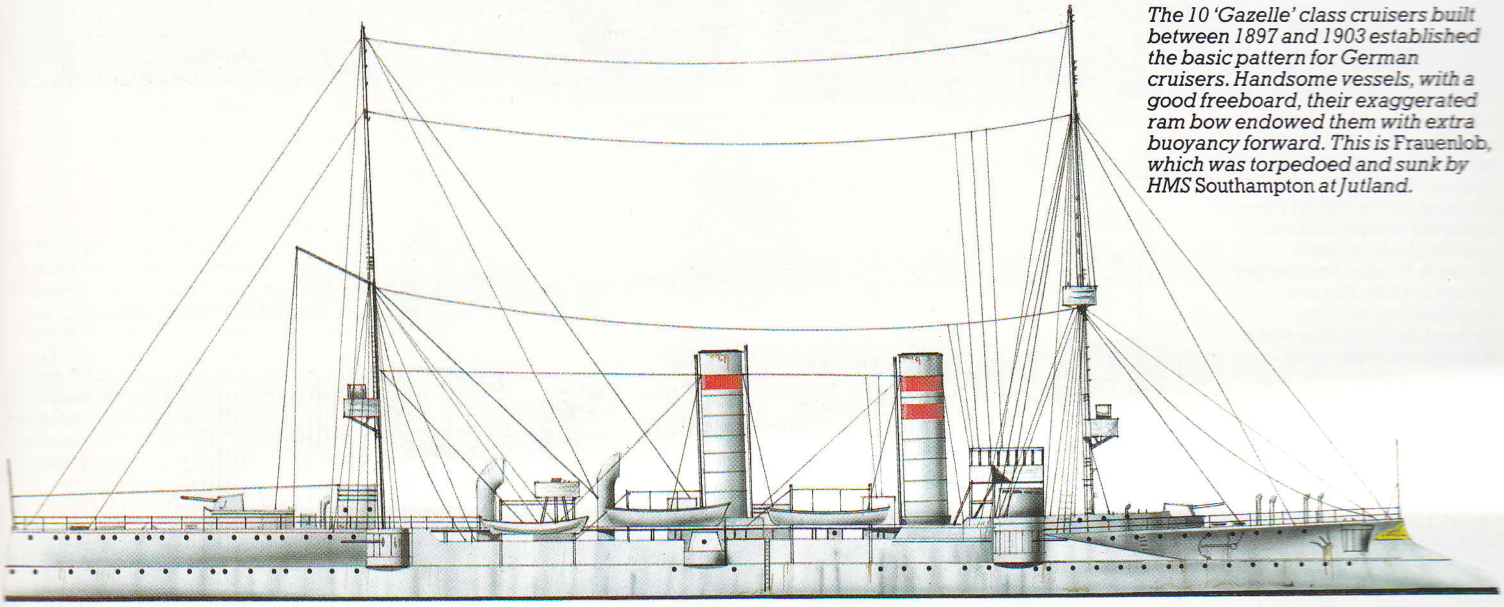
On the same length, therefore, the 'Gazelles' had another 1 m (3.3 ft) of beam and their horizontal protection doubled in thickness to 50 mm (1.98 in). Water-tube boilers produced a 40 per cent increase in power at no penalty while the main battery was improved to 10 105-mm (4.13-in) guns. These weapons probably influenced the British in their choice of 102-mm (4-in) weapons for their equivalent ships, though the German gun was more powerful, with a muzzle velocity that enabled it to outrange even the older 152-mm (6-in) gun of the Royal Navy.

The class was produced by the Germans as a fusion between earlier concepts of 'fleet' and 'overseas' cruisers, and were sized accordingly. Their initial duties were to screen the fleet against the attentions of torpedo craft, but as they were rapidly superseded by improved classes, they soon found themselves serving worldwide in Germany's burgeoning imperial interests. They were smart little ships, weatherly and with good freeboard, featuring an exaggerated ram bow which, like the French, gave extra buoyancy forward and improved lines on a limited length.

Despite their age they were well used during the war and suffered accordingly. *Ariadne* was shattered by close-range salvoes from Beatty's flagship HMS *Lion* at the Heligoland Bight action. *Frauenlob* was also there but was eventually sunk by a torpedo from HMS *Southampton* during the confused night action after Jutland. *Undine* was sunk in the Baltic in 1915 by the British submarine *E 19*.

Specification

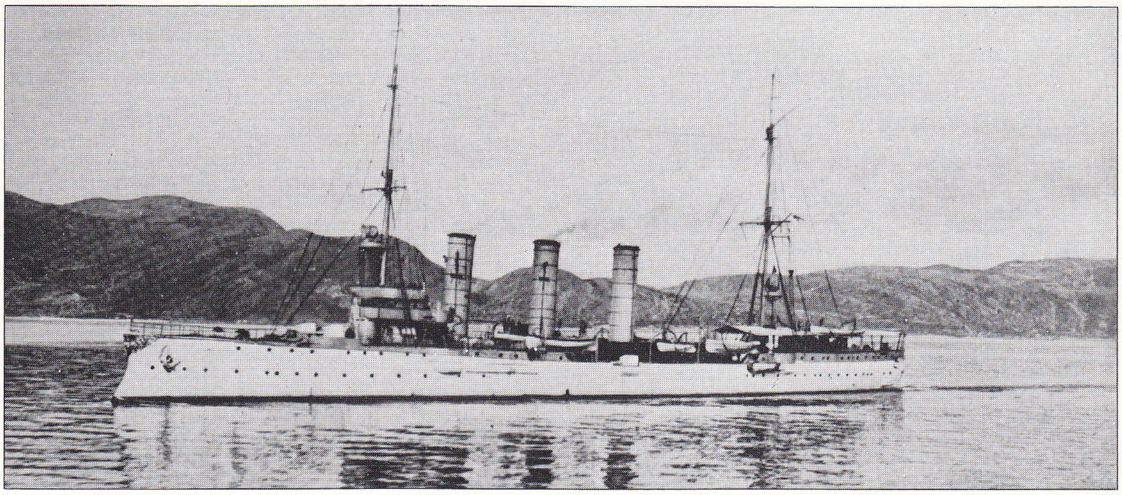
'Gazelle' class
Displacement: 2,605 tons standard
Dimensions: length 105.0 m (344.5 ft); beam 12.1 m (39.7 ft); draught 5.35 m (17.6 ft)
Propulsion: two sets of triple-expansion steam engines delivering 8,500 ihp (6,340 kW) to two shafts
Speed: 21 kts
Armament: 10 single 105-mm (4.13-in) guns and three 450-mm (17.7-in) torpedo tubes
Armour: 50-mm (1.98-in) deck
Complement: 260



The 10 'Gazelle' class cruisers built between 1897 and 1903 established the basic pattern for German cruisers. Handsome vessels, with a good freeboard, their exaggerated ram bow endowed them with extra buoyancy forward. This is Frauenlob, *which was torpedoed and sunk by HMS* Southampton *at Jutland.*

GERMANY

'Berlin' class



Königsberg, ***seen here in pre-war panoply, was at Dar-es-Salaam in 1914 and caught HMS*** **Pegasus** ***with her fires drawn off Zanzibar, sinking her in just 15 minutes.***

Besides the British, the German was the only fleet to build light cruisers in any numbers in time to make a significant contribution to the war. The 10 'Gazelles' had proved to be excellent prototypes and follow-on ships were heavily based on them, thence developing very logically from class to class. By the Kaiser's instruction the earlier mixed bag of names had to give way to uniformity, all new light cruisers being named after cities. Thus the five **'Berlin' class** cruisers, completed in 1904-5, were named after the capital (SMS ***Berlin***) the three Hanseatic city-states and München (Munich). They were essentially 'Gazelles' stretched by 6 m (20 ft) to accommodate 40 per cent more power, which necessitated a third funnel. They retained the same armament and scale of protection, also the characteristic positioning of the foremast forward of the bridge structure and the extreme 'ram bow'. Of this group SMS ***Lübeck*** became the first German cruiser to be propelled by steam turbines, her 14,000-shp (10440-kW) outfit being of Parsons' design; they were not geared at this time and, to absorb the power at high revolutions, an original multi-propeller arangement was tried on two shafts. The system was not particularly successful with the screw technology of the time and, pending evaluation, the three follow-ons in 1906-7 reverted to the well-tried triple expansion engine. Of these, SMS ***Danzig*** and ***Leipzig*** were virtual repeats but the one-off but similar SMS ***Königsberg*** was again lengthened, by 4 m (13.1 ft), to increase power to over 13,000 shp (9695 kW). It is of note that this extra size was not used to load the ship with any more armament and the 105-mm (4.13-in) gun was retained for its high rate of fire: up to 20 rounds per minute with a well-drilled crew. Compared with British ships of similar length, the Germans were a full 2 m (6.6 ft) wider in the beam, improving stability and also bunker capacity. Both the latter and the conservatively-rated machinery contributed to the ships' designed alternative role as commerce raiders. The *Königsberg* herself escaped from Dar-es-Salaam to operate in the Indian Ocean simultaneously with SMS *Emden*, but her major success was in surprising and overwhelming the little crusier HMS *Pegasus* off Zanzibar before tamely allowing herself to be blockaded and, eventually destroyed in the Rufiji delta.

Specification

SMS *Königsberg*

Displacement: 3,350 tons standard and 3,950 tons full load

Dimensions: length 115.25 m (378.1 ft); beam 13.33 m (43.7 ft); draught 5.1 m (16.7 ft)

Propulsion: two sets of triple-expansion steam engines delivering 13,200 ihp (9840 kW) to two shafts

Speed: 23.5 kts

Armament: 10 single 105-mm (4.13-in) guns and two 450-mm (17.7-in) torpedo tubes

Armour: 50-mm (1.98-in) deck

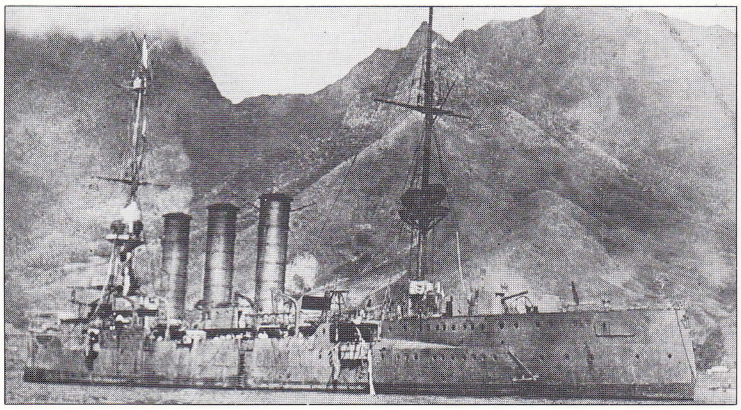
Complement: 320

GERMANY

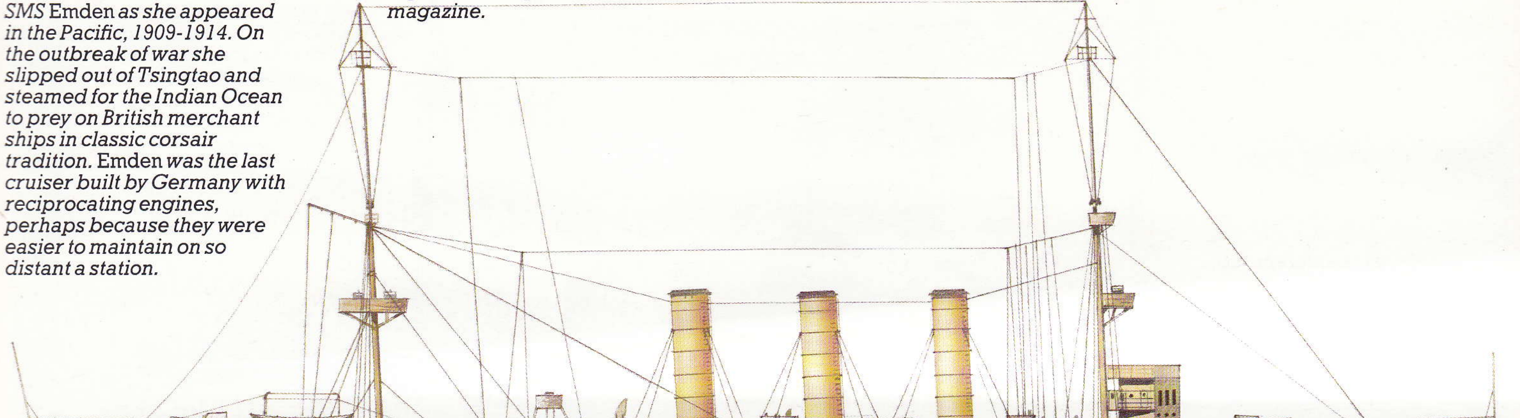
'Dresden' class

To follow the lone SMS *Königsberg*, the German navy built the three **'Stettin' class** and two **'Dresden' class** cruisers, which though officially of two classes were very similar. SMS ***Nürnberg, Stettin*** and ***Stuttgart*** were all completed in 1908, with SMS ***Dresden*** and ***Emden*** following in 1908-9. On the same beam as the earlier *Königsberg*, they were longer by about 3 m (10 ft), allowing a better machinery arrangement and slightly improved lines. The 'Stettins' were unique in the fleet in having a unequal spacing to their three funnels, while the nameship essayed a further experiment in steam turbines, the compact nature of which enabled the development of over 50 per cent more power for an extra 2 kts. In general, the machinery of German cruisers appears to have been conservatively rated as they were often capable of exceeding their legend speeds.

The two 'Dresdens' offered a better appearance with three equi-spaced funnels and a cleaner hull, from which the earlier sponsons (*Schwalbennster* or swallows' nests) had disappeared. The *Emden* was the last triple-expan-



Right: **Dresden** ***lies at Mas a Fuera. Cornered by HMS*** **Kent**, ***HMS*** **Glasgow** ***and the AMC*** **Orama**, ***she hoisted a white flag after the British opened fire and while the future Admiral Canaris, then a lieutenant, negotiated with the Royal Navy, her captain blew up her forward magazine.***



SMS **Emden** ***as she appeared in the Pacific, 1909-1914. On the outbreak of war she slipped out of Tsingtao and steamed for the Indian Ocean to prey on British merchant ships in classic corsair tradition.*** **Emden** ***was the last cruiser built by Germany with reciprocating engines, perhaps because they were easier to maintain on so distant a station.***

sion engined cruiser built by the Germans, the simple reliability of the machinery being a positive asset for the necessary self maintenance undertaken during her raiding cruise. Her turbine-driven sister *Dresden*, however, was the only one of von Spee's ships to be so fitted and was able to develop the extra speed necessary to out-distance Sturdee's cruisers at the Falklands and survive, while the very similar but reciprocating-engined *Nürnberg* was run down and destroyed by HMS *Kent*, whose stokers had worked miracles. It was very obvious that the almost universally 105-mm (4.13-in) gunned Germans were always at a disadvantage when unable to escape the British with their 152-mm (6-in) weapons. The *Dresden*'s existence was a lonely one. This was no area for raiding and she went into hiding in the desolate inlets of Tierra del Fuego for two months until, with her boiler in poor condition, she broke out to Juan Fernandez where, on 14 March 1915 she was cornered and sunk by HMS *Glasgow* and *Kent*.

Specification

'Dresden' class

Displacement: 3,590 tons standard and 4,270 tons full load

Dimensions: length 118.25 m (388.0 ft); beam 13.33 m (43.7 ft); draught 4.8 m (15.75 ft)

Propulsion: (*Dresden*) four sets of steam turbines delivering 10,800 shp (8,050 kW) to two shafts, or (*Emden*) two sets of triple-expansion steam engines delivering 14,500 ihp (10810 kW) to two shafts

Speed: 26 kts

Armament: 10 single 105-mm (4.13-in) guns and two 450-mm (17.7-in) torpedo tubes

Armour: 50-mm (1.98-in) deck

Complement: 360

GERMANY

'Breslau' class

The four 'Kolbergs', completed in 1909-10, were a full 12 m (39.4 ft) longer than the 'Dresdens' despite being the first all-turbine class. They doubled the installed power of the earlier ships, increased bunker space and took another two 105-mm (4.13-in) guns. This was contemporary with the British 'Boadicea' class, smaller ships with only six to 10 102-mm (4-in) weapons. When, the following year, the Royal Navy replied with the first 'Town' group (the 'Bristol' class) they built them slightly larger than the 'Kolbergs', though similar in power and scale of protection. Significantly, however, they also put aboard a pair of 152-mm (6-in) guns.

The deliberately-developing German series continued almost without a break with the four **'Breslau' class** cruisers (SMS ***Breslau, Magdeburg, Stralsund*** and ***Strassburg***). These were comparable in size to the Bristols and, interestingly, the quartet included double-, triple- and quadruple-shaft propulsion, for evaluation purposes. Both power and speed differed considerably, the ships (like the British units) adopting a four-funnel layout. The stacks were typically German, being cased for only half their height. Boiler efficiency was improved somewhat by adopting oil burners to supplement the coal in the furnace. While retaining the gun armament of the 'Kolbergs', they increased the torpedo armament from two 450-mm (17.7-in) to four 500-mm (19.7-in) tubes. Another innovation was to reduce the protective deck from the previously universal 50 mm (1.98 in) to only 15 mm (0.6 in) while introducing a new feature in a 70-mm (2.76-in) belt. This was a fundamental change of heart, not born of battle experience. War, however, was to show that the fast rate of fire of the 105-mm guns was still no match for the fewer and slower British 152-mm guns and several groups of German cruisers were regunned with 150-mm (5.9-in) weapons.

Magdeburg was lost as early as 26 August 1914, being destroyed by the Russians after grounding in the Gulf of Finland. The recovery of her codebooks proved priceless to the Allies. Her sister *Breslau* was something of a *cause célèbre* when, with the battle-cruiser SMS *Goeben*, she reached Turkey at the outbreak of war. As the *Yavuz Sultan Selim* and *Midilli* they were an endless threat to both the Russians in the Black Sea and the Anglo-French forces outside the Strait. *Midilli* was sunk by running into a British minefield in January 1918.

Specification

'Breslau' class

Displacement: 4,550 tons standard and 5,590 tons full load

Dimensions: length 138.5 m (454.4 ft); beam 13.5 m (44.3 ft); draught 5.1 m (16.7 ft)

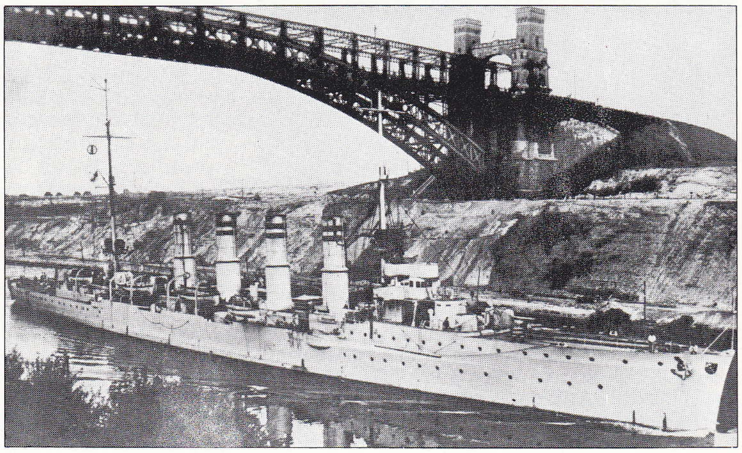
Propulsion: two (*Strassburg*), three (*Magdeburg* and *Stralsund*) or four (*Breslau*) sets of steam turbines delivering between 22,300 and 33,500 shp (16625 and 24980 kW) to two, three or four shafts

Speed: 28 to 30 kts

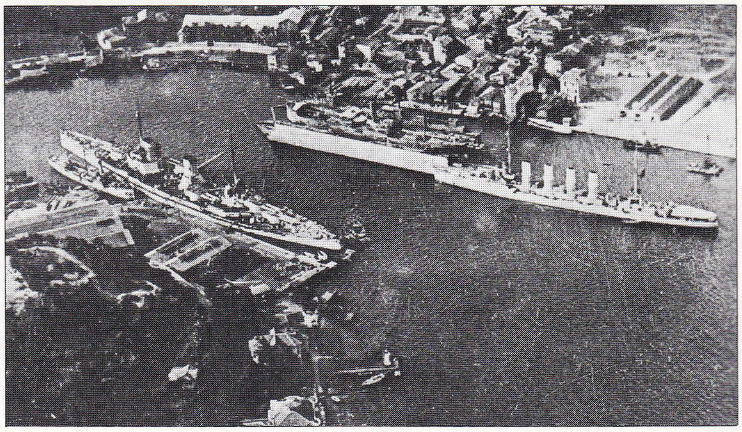
Armament: 12 single 105-mm (4.13-in) guns (later altered to seven single 150-mm/5.9-in guns) and four 500-mm (19.7-in) torpedo tubes

Armour: 15-mm (0.6-in) deck and 70-mm (2.76-in) belt

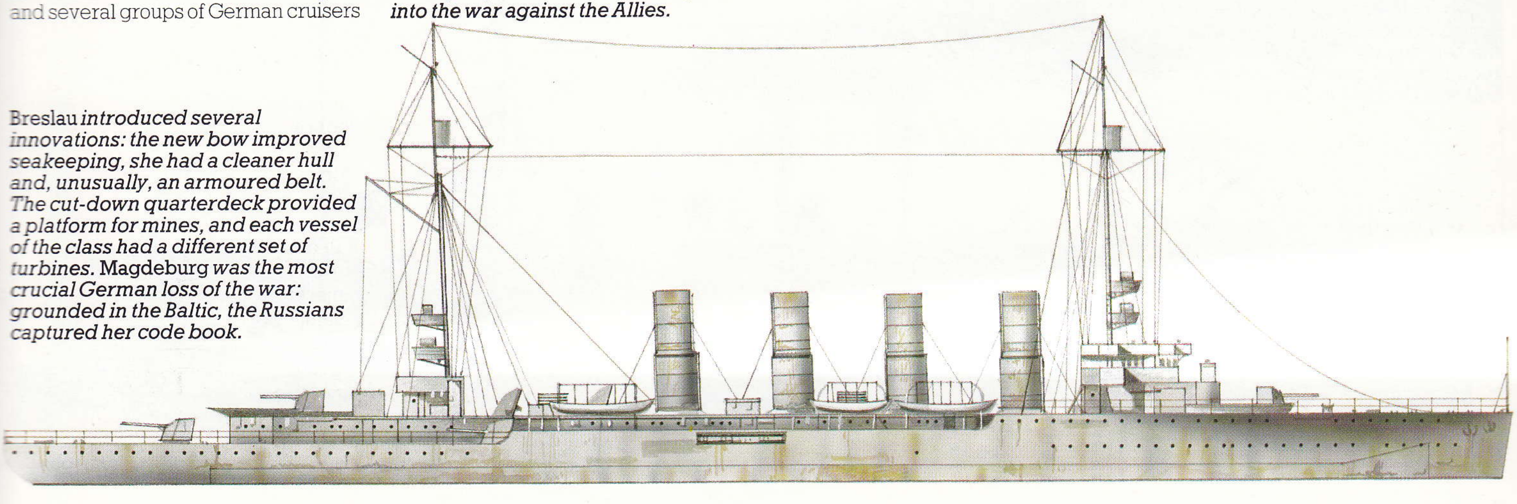
Complement: 365



Like Goeben, Breslau *'joined' the Turkish navy; styling herself* 'Midilli', *she and the battle-cruiser threatened Russian forces in the Black Sea and Allied units in the Aegean. She perished when a sortie in January 1918 went disastrously wrong;* Breslau *struck five British mines and sank, while* Goeben *was mined too, stranded, and had to be towed to safety.*



Right:** Breslau at Constantinople with* **Goeben.** ***Their passage across the Mediterranean represented a humiliating defeat for the Allied navies and was a stunning strategic victory for Germany, since the imposing presence of the squadron enabled pro-German elements in Turkey to pitch the Ottoman Empire into the war against the Allies.



Breslau *introduced several innovations: the new bow improved seakeeping, she had a cleaner hull and, unusually, an armoured belt. The cut-down quarterdeck provided a platform for mines, and each vessel of the class had a different set of turbines.* Magdeburg *was the most crucial German loss of the war: grounded in the Baltic, the Russians captured her code book.*

GERMANY

'Frankfurt' class

The four 'Breslaus' were followed in 1913 by the pair of twin-screwed 'Karlsruhes', nearly identical except for the almost-obligatory slight increase in length and beam. Improved boiler and layout enabled the next pair (SMS *Graudenz* and *Regensburg*) of 1914 to revert to three funnels, being otherwise similar. Both of these pairs were later rearmed with 150-mm (5.9-in) guns, but the first to take them from the outset were also the first to be completed during the war and after the early lesson of the Heligoland Bight action, SMS ***Frankfurt*** and ***Wiesbaden*** of the **'Frankfurt' class.** War experience not only decided their main battery of eight larger guns, but added a pair of HA 88-mm (3.46-in) weapons for use against aircraft. The new belt and splinter deck protection was also confirmed as correct and repeated subsequently in all other war-built light cruisers. A small increase in beam enabled them to ship 120 mines on deck, another improvement to be repeated in later ships. An innovation in machinery led to the 'Frankfurts' being fitted with reduction gears for their steam turbines (contemporary with the same addition in the British 'Cs').

With shared priorities, the early severe losses in light cruisers sustained by the German fleet were hardly recovered during the war, only six more actually being completed (and repeating names of lost ships), together with a pair of 'windfalls' building to Russian account, and a further pair of specialist cruiser-minelayers. Eight more, launched or building at the Armistice, were never completed.

Frankfurt and *Wiesbaden* participated at Jutland as part of the 2nd Scouting Group. Both, with SMS *Pillau*, were badly treated when they ran into Hood's battle-cruisers, the *Wiesbden* becoming a total wreck in being an immobilized 'Aunt Sally' between both fleets though remaining afloat for nearly 12 hours after having sustained a fearful battering. *Frankfurt* survived the war to be surrendered with the High Seas Fleet. She was not sunk in the general scuttling of 21 June 1919 at Scapa Flow, being one of the ships beached in time by the Royal Navy. She was eventually transferred to the Americans and expended in 'Billy' Mitchell's controversial aerial bombing trials.

Specification

'Frankfurt' class

Displacement: 5,150 tons standard and 6,600 tons full load

Dimensions: length 145.3 m (476.7 ft); beam 13.9 m (45.6 ft); draught 6.1 m (20.0 ft)

Propulsion: two sets of geared steam turbines delivering 37,500 shp (27960 kW) to two shafts

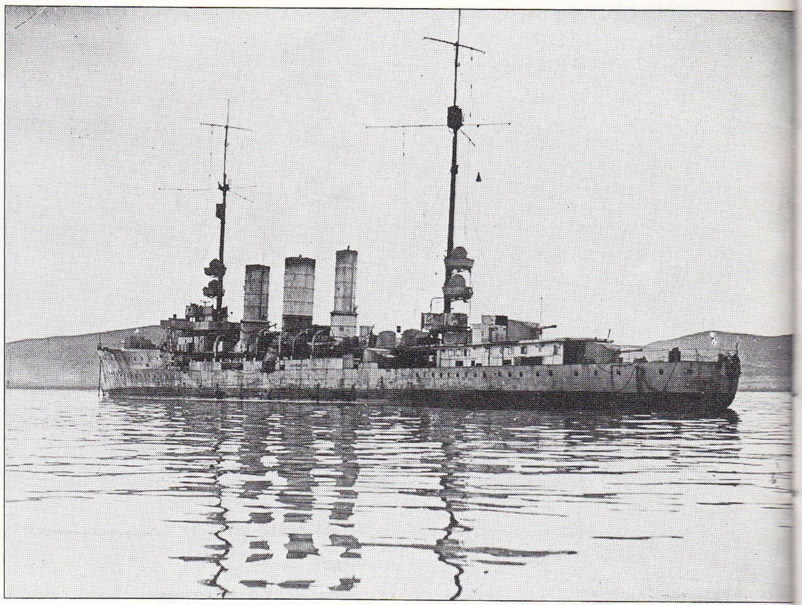
Speed: 28 kts

Endurance: 8900 km (5,530 miles) at 12 kts

Armament: eight single 150-mm (5.9-in) and two 88-mm (3.46-in) guns, four 500-mm (19.7-in) torpedo tube and 120 mines

Armour: 20-mm (0.79-in) deck and 70-mm (2.76-in) belt

Complement: 500



Frankfurt *and* Wiesbaden *were the first German light cruisers to receive 150-mm (5.9-in) guns for their main armament. They also mounted a pair of 88-mm (3.4-in) anti-aircraft guns. A modest increase in beam allowed them to carry 120 mines on deck.*

RUSSIA

'Askold' class

To the Russians Askold was an early Varangian chieftain, but to the Royal Navy that knew her well, the ship ***Askold*** was simply the 'Packet of Woodbines', one of the few ships outside the French navy boasting more than four funnels. The ship was launched in 1899 by the Krupp-Germania Werft at Kiel and, though contemporary with the German 'Gazelle' class was closer in concept to the earlier 'Freyas'. In common with others of the date, she was truly a protected cruiser in the sense that her armour was horizontal, in the form of a full-length protective deck and an armoured glacis over the high cylinder tops of the reciprocating engines. Her major function differed from her German contemporaries in that she, like her compatriots *Bogatyr* and *Variag*, was designed for commerce raiding. The 23-kt contract speed was high for its time and demanded a long, fine hull and nine double-ended watertube boilers, whose compartmentation resulted in the five funnels. Three engines were required and over two-thirds of the hull was devoted to machinery.

All main battery guns were mounted singly, eight with light shields and on the open deck and four casemated. The forecastle was very short and the concentration of weight forward gave her a reputation for wetness and, in order to meet the demands of the specification, her builders (not familiar with this class of ship) underestimated for scantlings in some areas of the hull. Nevertheless, she had a successful and useful career.

As part of the Port Arthur squadron during the Russo-Japanese war, *Askold* broke out of the beleaguered base in August 1904 by imperial decree and was one of the few to escape, arriving at Shanghai considerably damaged. She was here interned, thus escaping the debacle of Tsushima. In the Far East at the outbreak of World War I, she came under British operational control, taking part in the search for von Spee, escorting convoys in the Indian Ocean and then serving in the Mediterranean, on the Levant coast and at the Dardanelles. Following the 1917 revolution and with the UK siding against the Bolsheviks, she was taken over by the British and lay rusting until returned and scrapped in 1922.

Specification

Askold

Displacement: 5,910 tons standard

Dimensions: length 132.1 m (433.4 ft); beam 15.0 m (49.2 ft); draught 6.2 m (20.3 ft)

Propulsion: three sets of triple-expansion steam engines delivering 19,650 ihp (14650 kW) to three shafts

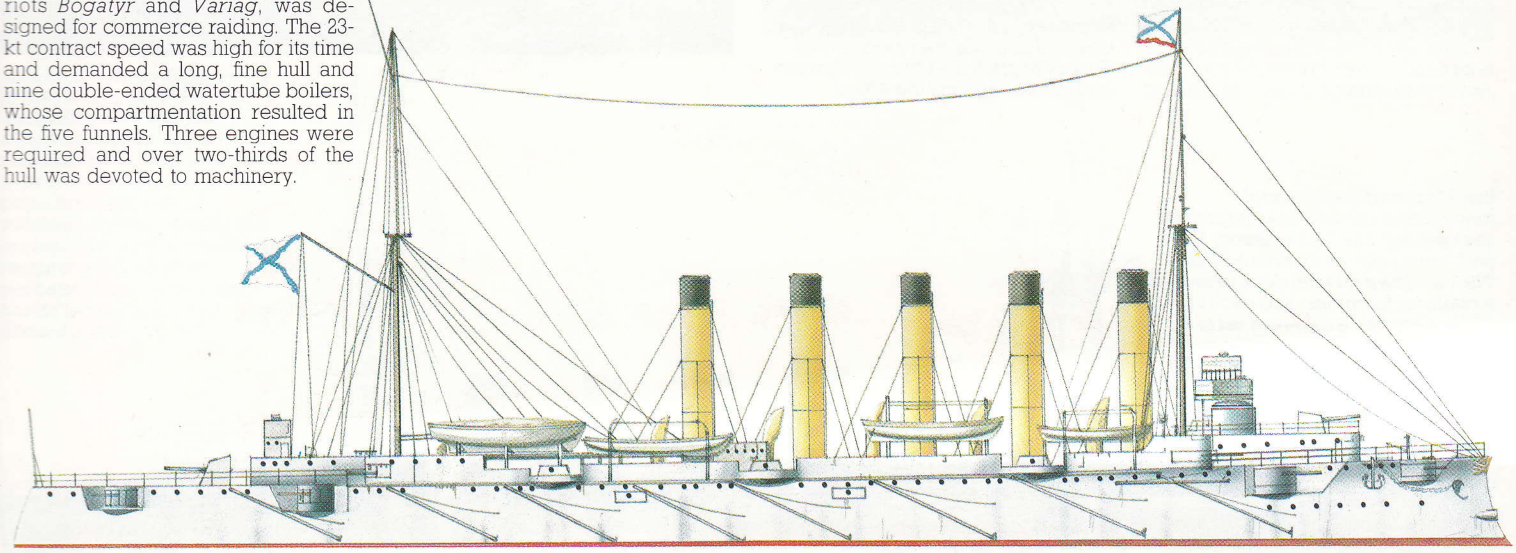
Speed: 23.5 kts

Armament: 12 single 152-mm (6-in) and 12 single 76-mm (3-in) guns, and six 380-mm (15-in) torpedo tubes

Armour: 50-mm (1.98-in) deck, and patches of 100-mm (3.94-in) and 38-mm (1.5-in) armour over the machinery spaces

Complement: 500

Askold, *seen as completed in 1901, had a very active career; her beautiful colour scheme replaced by a coat of grey, she fought the Japanese off Port Arthur in 1904 and broke out to Shanghai and internment. In 1914 she joined the hunt for von Spee's squadron.*



Emden's Epic Raid

In August 1914 Germany's Pacific squadron gathered in the Marianas, and at the suggestion of her captain the cruiser* Emden *was detached to raid British commerce in the Indian Ocean. Conducted in the classic corsair tradition, her cruise attracted worldwide attention, and the chivalry and daring of her captain won praise even from his enemies.

Captain Karl Friederich Max von Müller became the most famous German sea captain, his name a byword for chivalry and enterprise. He joined Emden *in the Far East in 1913 and soon made a name for himself dealing with brigands on the Yangtse. It was he who suggested a campaign in the Indian Ocean, and he executed it with rigorous professionalism.*

Safeguarding Germany's interests in the Far East was Vice-Admiral Graf von Spee's East Asiatic Squadron, based on the limited facilities of Tsingtau in northern China. Its major units comprised the armoured cruisers SMS *Scharnhorst* and *Gneisenau*, and the light cruisers SMS *Emden, Nürnberg* and *Leipzig*.

His area of responsibility being vast, von Spee spent considerable time at sea. Following the Sarajevo affair in June 1914, war looked inevitable and, taking the practical view that Tsingtau would be indefensible against Allied naval power, he decided to get 'lost' in the Pacific, thus avoiding the fate of the Russian Port Arthur squadron a decade before.

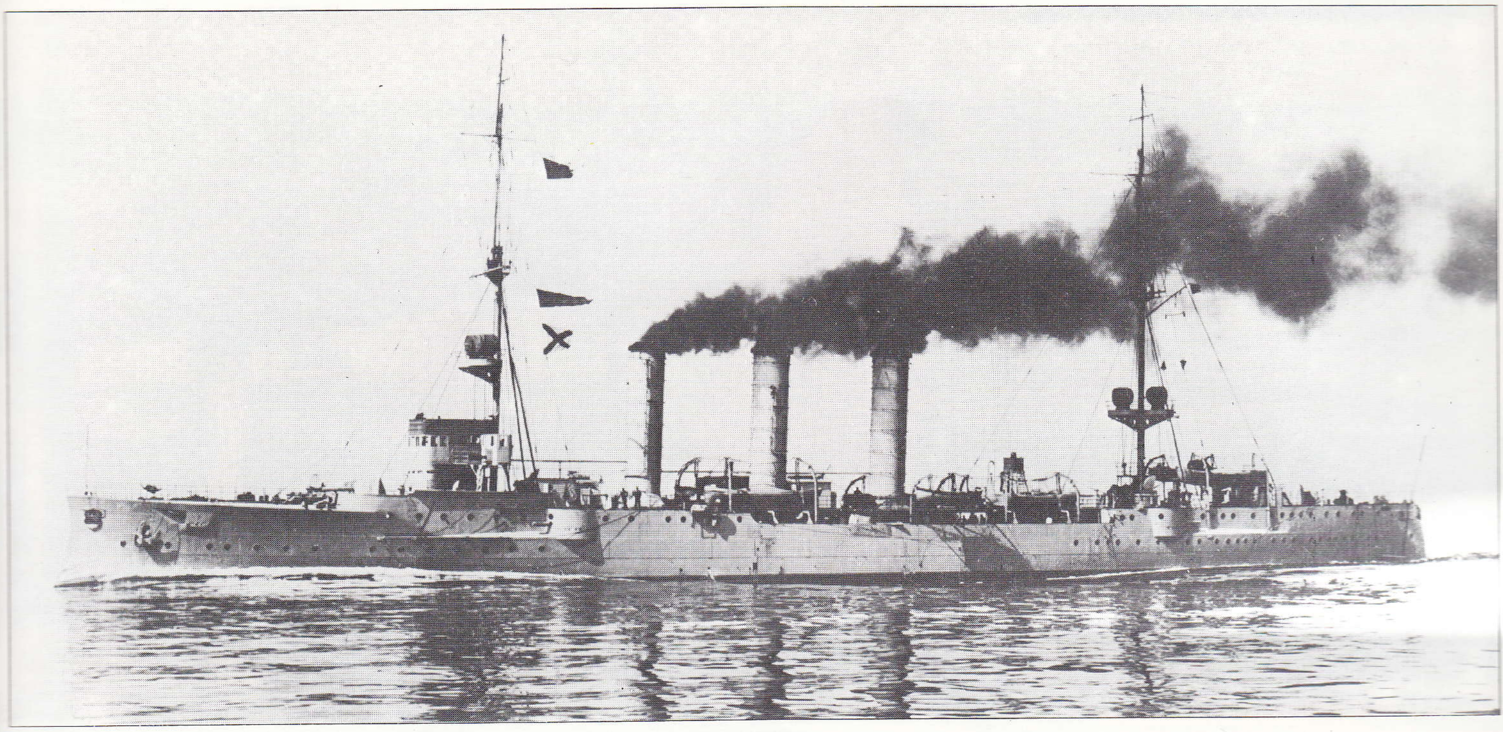
Only the *Emden* remained and, on the receipt of the warning telegram on 30 July her captain, von Müller, put to sea to await events. Hostilities against Russia commenced on 3 August and the *Emden* captured the new auxiliary *Rjasan*, which she took back to Tsingtau for rapid conversion to a raider (*Kormoran*). By now the UK and France were also hostile, and Japan was also expected to declare, so von Müller wasted no time, topped up and sailed on 6 August with two auxiliaries to rendezvous with von Spee in the Marianas. A conference there on 12 August decided that the squadron should make for Germany via the Pacific and the Horn but von Müller, having convinced his senior of the great prospects open to a cruiser in the Indian Ocean, was allowed his own way.

'My dutiful thanks for the confidence placed in me. Success to the Squadron and Bon Voyage': with this valedictory signal *Emden* left von Spee to his separate fate of Coronel and the Falklands. Von Müller moved at a leisurely pace through the myriad islands of Indonesia, honing both ship and crew to peak efficiency. As they passed Celebes on 23 August they heard of war with Japan and the pursuing of old scores in her investment of Tsingtau. *Emden* was now without friends or facilities.

A first problem was the failure of a collier to make a pre-arranged rendezvous off Timor and bunkers were taken from an auxiliary. On 27 August the little cruiser came through the Lombok Strait and entered the Indian Ocean. British radio discipline was slack, von Müller rapidly becoming aware of major activity in the area. During the week spent running the length of Java and Sumatra, a dummy fourth funnel was contrived to give the appearance of a British 'Town'. A second coaling stop at the northern end of Sumatra also failed and had to be resolved as before, the ships almost running foul of the British cruiser HMS *Hampshire*, one of a force seeking another German, SMS *Königsberg*.

From here, von Müller struck out across the Indian Ocean but, despite crossing major trade routes, arrived north east of Ceylon on 10 September having taken only a Greek ship, loaded with contraband (and invaluable) British coal. *Emden* then followed the Colombo-Calcutta route northward and was immediately rewarded. Her first prize was the British ship *Indus*, which was stripped of useful items (particularly soap that was in very short supply) before being sunk. Four other ships were taken in rapid succession but their crews were becoming an embarrassment in numbers. A passing neutral Italian was stopped and requested to take them to land but refused, afterwards warning the British *City of Rangoon* of the *Emden*'s presence. This ship broadcast a general raider warning, the first confirmation of von Müller's whereabouts. While the latter realized that to dally would be disastrous, he took the British *Kabinga*, sparing her to transport his 250-odd captives and, incidentally, beginning his great reputation for fairness and humanity.

Dangerously close to the Sandheads he captured the empty collier *Trabbock*. To sink her without delay he used his guns rather than charges but, in the depth of night, the dust-



Emden*'s graceful profile soon began to haunt the minds of ship owners in the Indian Ocean; her raid on Madras sent shock waves across India, and 'Emden' came to be used in the local Tamil dialect to mean 'an ingenious person'.*

laden atmosphere inside the ship's holds was inadvertently detonated in a shattering explosion. This brought the *Clan Matheson* to the scene to offer assistance, this ship and her valuable piece-goods cargo also being lost as a consequence. With ample radio evidence of British, French and Japanese cruisers on her trail, *Emden* was now obliged to vacate the lucrative Calcutta approaches, heading south eastward toward Rangoon. The movement had been anticipated and the raider found the area clear of shipping, though the radio traffic was ever more threatening. Von Müller therefore turned to the west, again narrowly missing the *Hampshire* as he set out across the Bay of Bengal.

Oil tank attack

At about 22.00 on 22 September *Emden* boldly appeared off Madras, approaching to within 3000 m (3,300 yards) to bombard and destroy the extensive tank storage facilities of the Burmah Oil Compnay. Dazzling the port battery with his searchlights, von Müller got off 125 rounds in short order and was away. The material gain was small compared with the effect on British morale.

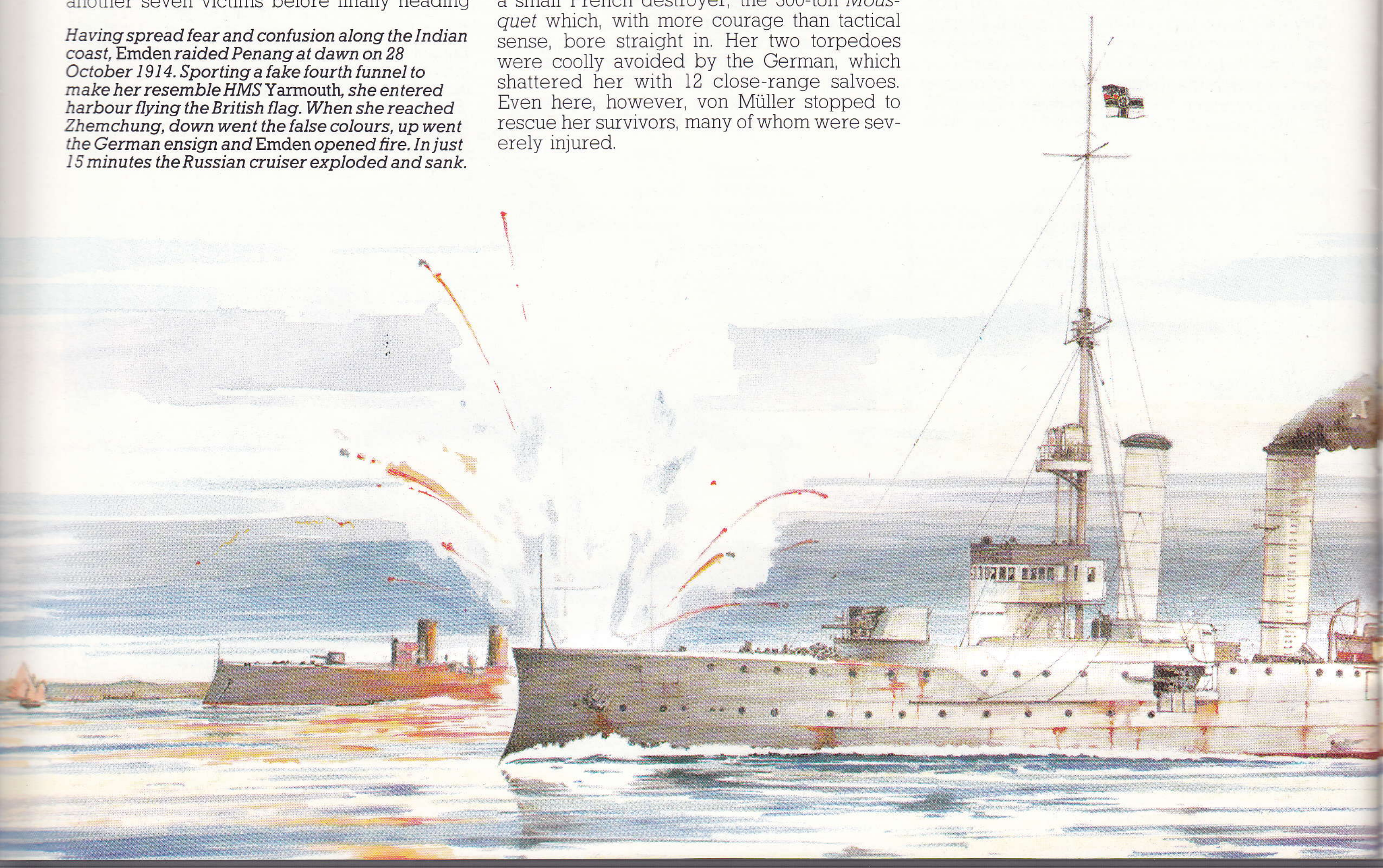
Heading southward, the *Emden* cheekily looked in to the French ports of Pondicheri and Cuddalore, rounded Ceylon and arrived at the traffic focal point south of Cap Conmorin just ahead of the chase. Half a dozen prizes were taken, one (the British *Buresk*) being taken along for her cargo of first-quality steaming coal.

Expecting von Müller to double back to the Indies the Allies sent cruisers to the area but were frustrated as the German moved south to Diego Garcia for a period of self maintenance. Following this, the *Emden* returned to claim another seven victims before finally heading westward for a coaling rendezvous in the Nicobars.

A raider bereft of facilities needs to avoid damage at all costs, and von Müller's next step seems almost foolhardy. Intelligence indicated an old French cruiser at Penang, and resolving to attack her *Emden*, with her fourth 'funnel' rigged, entered through the outer anchorge at first light on 28 October. What she found was the little Russian cruiser *Zhemchug* which, totally surprised, was overwhelmed at close range by a hail of gunfire and torpedoes. Understandably, von Müller pulled out rapidly but, two hours out, stopped an inward-bound British Glen liner. His action was interrupted by a small French destroyer, the 300-ton *Mousquet* which, with more courage than tactical sense, bore straight in. Her two torpedoes were coolly avoided by the German, which shattered her with 12 close-range salvoes. Even here, however, von Müller stopped to rescue her survivors, many of whom were severely injured.

09.30 hrs, 10 November 1914: Emden*'s losing battle with the* Sydney *could be watched from the roof of the wireless station on the island and von Mücke decided to seize the schooner anchored offshore and escape with the landing party.*

The *Emden* rounded the northern tip of Sumatra and ran southward along the island's coast. Allied efforts to catch her were diluted by necessary operations against the *Königsberg*, off the African coast, and the need to cover vast movement of troops by sea. Having peeped briefly and unrewardingly into the Sunda Strait, von Müller resolved to complete-



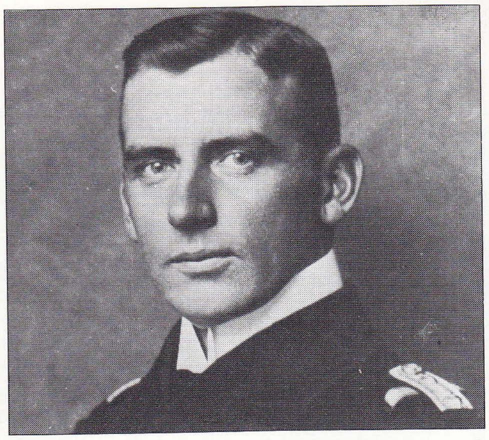
Having spread fear and confusion along the Indian coast, Emden *raided Penang at dawn on 28 October 1914. Sporting a fake fourth funnel to make her resemble HMS* Yarmouth*, she entered harbour flying the British flag. When she reached Zhemchung, down went the false colours, up went the German ensign and* Emden *opened fire. In just 15 minutes the Russian cruiser exploded and sank.*

ly change his area to the Red Sea approaches. On his way he made a fateful decision to detour and destroy the important British Cable and Wireless station in the Cocos-Keelings.

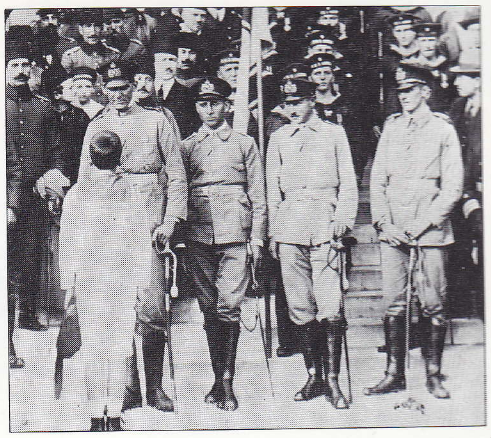
Warning broadcast

This move had long been anticipated and an alert staff rapidly saw through the German's four-funnel disguise when she approached early on 9 November and broadcast a powerful warning en clair. To avoid possible bloodshed through shelling, von Müller put a 50-strong landing party ashore but these were almost immediately marooned when the *Emden* suddenly got under way. A British cruiser had been sighted. She was, in fact, the Australian 152-mm (6-in) ship HMAS *Sydney* which, observing radio silence, had been just below the horizon, covering a convoy. Besides her heavier main battery, the newcomer was clean and had at least a 4-kt speed advantage which her captain, Glossop, used to full advantage to dictate the range and the course of the action.

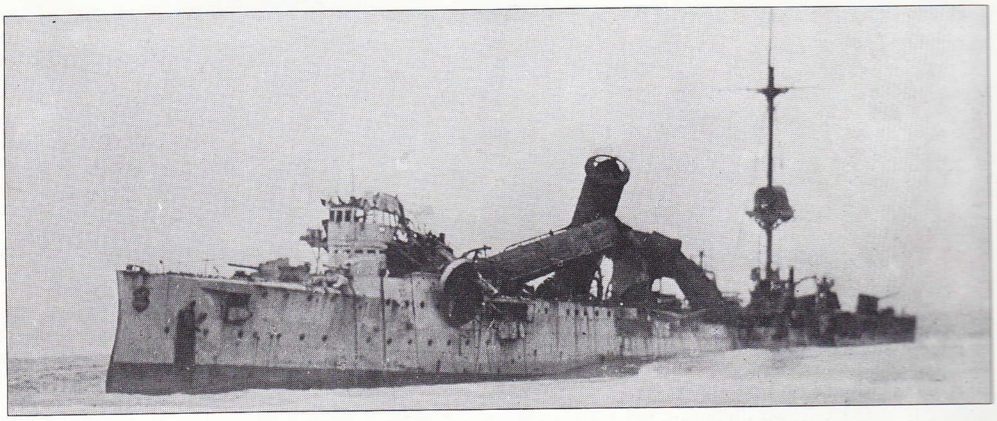
The German policy of lighter-calibre but faster-firing gun sometimes, as here, worked to their disadvantage. Despite accurate return fire, the heavier vessel's salvoes soon began to tell. The *Emden*'s rangefinder was destroyed and her steering gear damaged, the latter problem being compounded by loss of speed following the toppling of two funnels. The formast went by the board and the ship began to flood from damage sustained below the protective deck. In the lightly-protected gun positions, the carnage caused by fragments and blast was appalling and, after 100 minutes of hopeless action, von Müller ran his wrecked command onto the reef of North Keeling. Nearly half his crew was dead and most of the remainder wounded, while the Australian had suffered only slight damage and four fatal casualties in disposing of this most successful of the German raiders. She had caused the British great material damage, but this was of little consequence compared with the associated disruption to movements and tying down of much Allied naval strength in her apprehension.



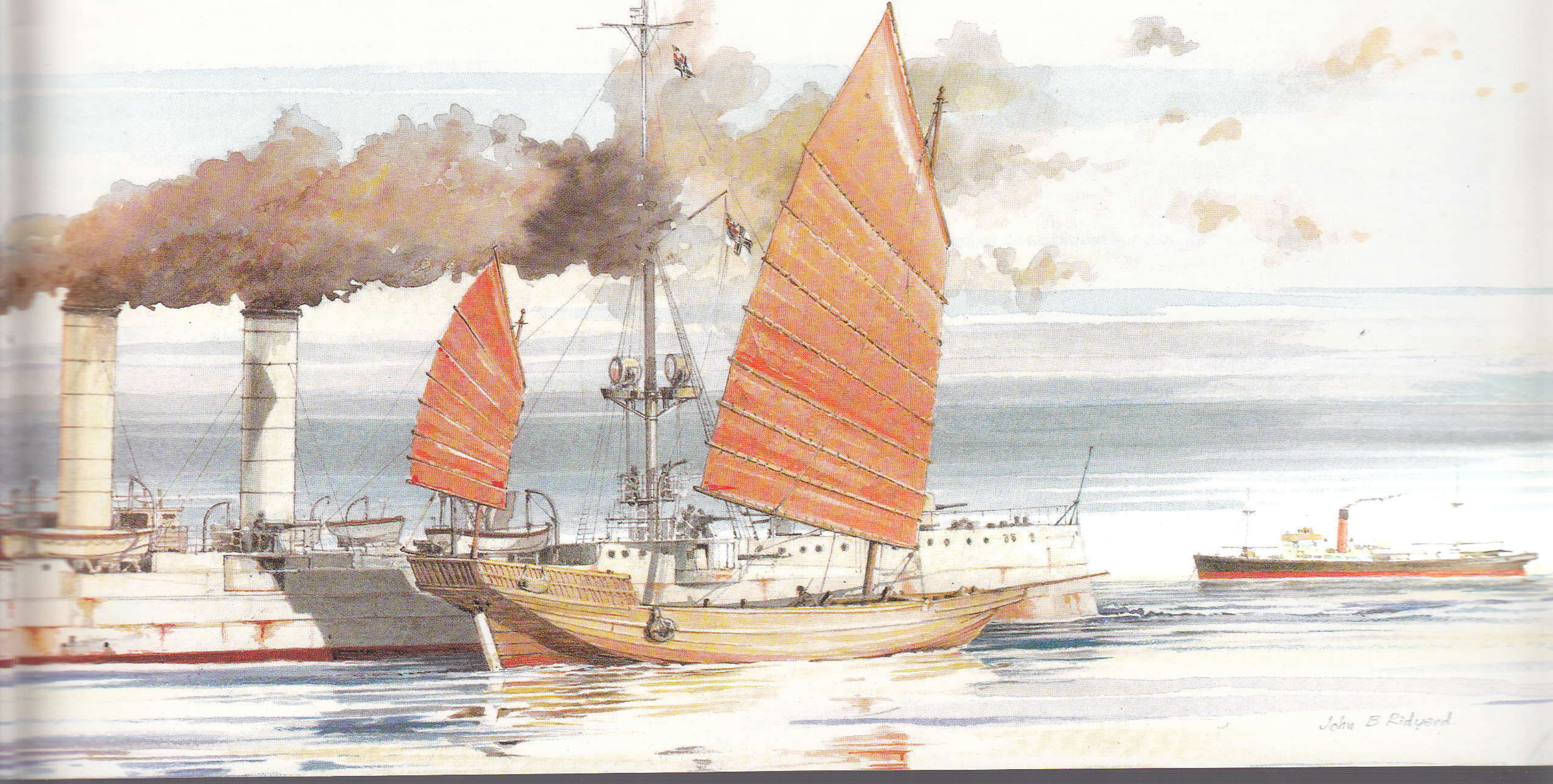
Kapitänleutnant Hellmuth von Mücke, Müller's 'Number One', was a resourceful extrovert whose epic journey back to Germany made a dramatic postscript to the sinking of the Emden. *It was his idea to rig a fourth funnel on the ship to give her a silhouette resembling that of HMS* Yarmouth.



Von Mücke brought the landing party to Constantinople where they were received by Admiral Wilhelm Souchon. They had sailed across the Indian Ocean, evading the Royal Navy, survived Turkish double-dealing and fought off Arab brigands in a battle in the desert.



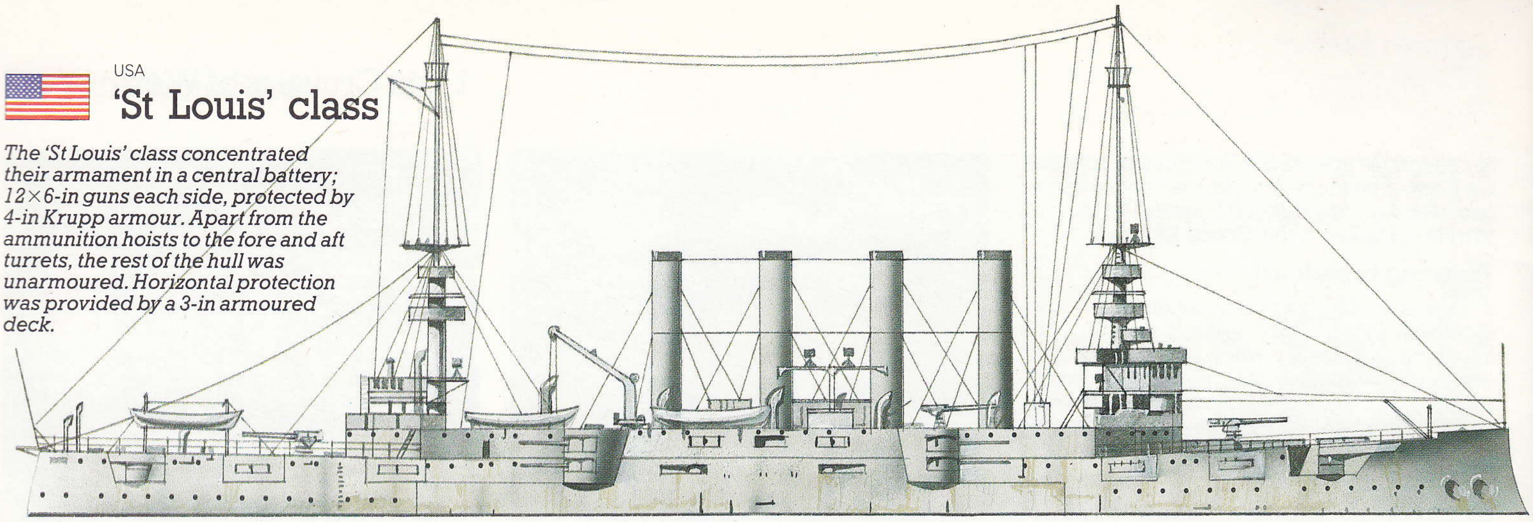
This is the end: shot to pieces by Sydney*'s heavier broadsides,* Emden *was run ashore on North Keeling Island; over 60 per cent of her crew became casualties. In her raiding career she had covered 30,000 miles, sunk 16 British ships and inflicted damage to the tune of about £5,000,000 – some 15 times the cost of building* Emden.



USA

'St Louis' class

The 'St Louis' class concentrated their armament in a central battery; 12×6-in guns each side, protected by 4-in Krupp armour. Apart from the ammunition hoists to the fore and aft turrets, the rest of the hull was unarmoured. Horizontal protection was provided by a 3-in armoured deck.



Until rendered obsolete by the introduction of the battle-cruiser, the armoured cruiser looked set to be an important feature of the US fleet, initially indeed taking the state names reserved at that time for capital ships. Since 1892 the fleet had, by policy, built almost entirely 'first-class battleships and first-class cruisers', so second- and third-class cruisers were produced in only small numbers in the 1890s for coastal defence and to maintain a presence at the few American colonial possessions. Following the war of 1898 with Spain and the acquisition of more foreign territory, two Elswick cruisers were taken over from Brazilian account, but the workmanlike design of these little ships had no influence whatsoever on the six 'Denver' class colonial cruisers (Nos 14-19) that followed in 1901-3. It was, therefore, a considerable change of policy that suddenly produced the three **'St Louis' class** ships (USS ***Charleston, Milwaukee*** and ***St Louis***) which though they took the next pendants (20-22) had nothing else in common.

In 1899 the British had effectively introduced the armoured cruiser by adding a belt to the design of the 'Diadem' class protected cruisers then just completed. In a neat reversal of this move the Americans created a diminutive of the 'California' (later 'San Diego') class armoured cruisers and of a size with the contemporary British 'Monmouths' with whom they shared a common main battery of 14 152-mm (6-in) guns. Where the British policy was to work in a shallow 102-mm (4-in) belt over the greatest possible length and protect otherwise only the two level casemates the Americans carried on the central battery idea from the 'Californias', encasing it in 102-mm steel with a short extension both forward and aft to cover the machinery spaces. Predictably, the navy considered them underarmed but, though they also carried light horizontal protection, their primary drawback was in their being no faster than armoured cruisers. As their economy was not seen as a virtue they were to languish along with them. The *Milwaukee* was a war loss.

Specification

'St Louis' class
Displacement: 9,700 tons standard
Dimensions: length 123.0 m (426.5 ft); beam 20.1 m (66.0 ft); draught 6.9 m (22.5 ft)
Propulsion: two sets of triple-expansion steam engines delivering 24,000 ihp (17895 kW) to two shafts
Speed: 22 kts
Armament: 14 single 152-mm (6-in) and 18 single 76-mm (3-in) guns
Armour: 76-mm (3-in) deck and 102-mm (4-in) belt
Complement: 668

USA

'Omaha' class

Perhaps surprisingly, the US Navy launched no cruisers between 1907 and 1920. By the time that isolationism had turned to active involvement in the war in 1917, the maritime threat from Germany was primarily through her submarines rather than her battlefleet, and it was on building destroyers that USA concentrated. Even so, the gap in cruiser construction is difficult to justify.

A long series of armoured cruisers, powerful enough to rank as third-class battleships, had been rendered rudely obsolescent in 1906 by the introduction of the battle-cruiser. Further, while the Civil War had demonstrated the value of both the blockade-runner and commerce raider, the fast cruiser descendent of the latter had no place in the war likely to be fought by 20th-century USA.

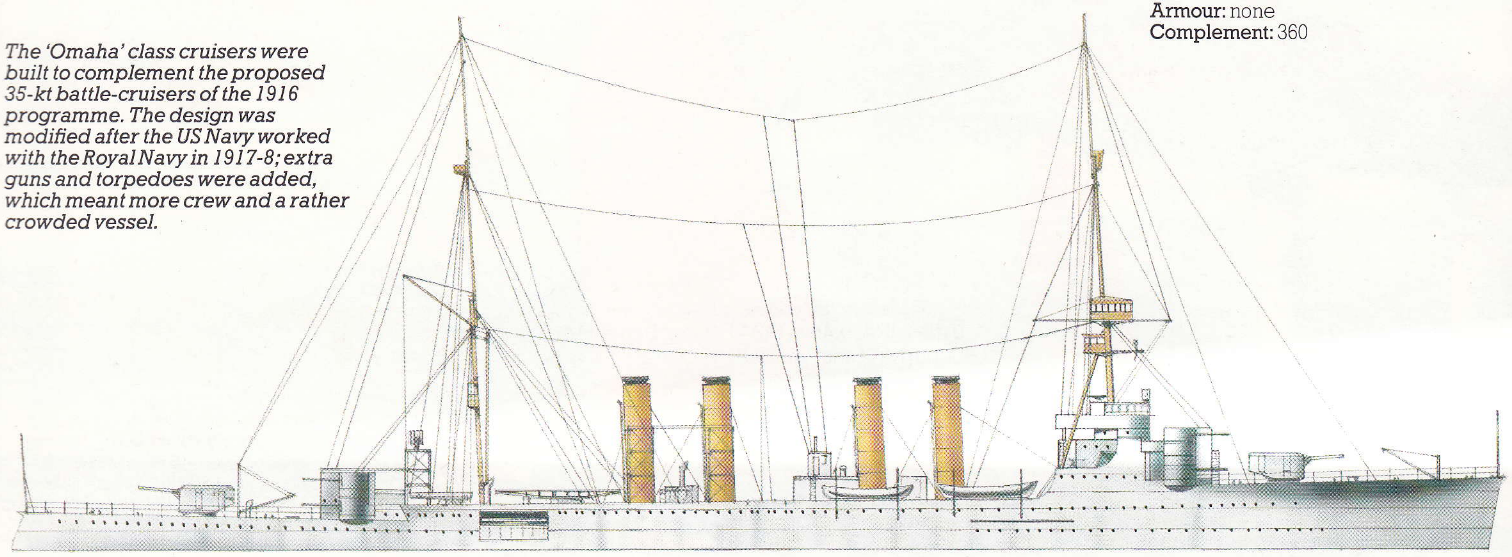
Thus, the only likely role for the cruiser to a nation lacking a real empire was that of scouting for the main body of the fleet. The UK had introduced the steam turbine-driven light cruiser with HMS *Amethyst*, completed in 1904, and the possibilities posed by this new form of compact but powerful machinery led the US Navy to build the three 3,750-ton 'Chesters' (CL 1-3), all launched in 1907, to evaluate reciprocating machinery against direct-drive and geared turbines. The US Navy, however, did not (and indeed does not) like small ships and the American cruiser thus languished for lack of a raison d'être.

Probably more because both the UK and Germany made good use of light cruisers rather than through a perceived need, a new class of 10 cruisers had been authorized in 1916, classified as 'scouts' despite being half as large again as any light cruiser in Europe. The **'Omaha' class** ships (CL 4-13) were not, however, to be completed until after the war. They were interesting vessels with the large number of boilers for their 34 kts in two groups, resulting in two distinctive pairs of funnels, giving them the appearance of overgrown flushdecked destroyers. Their original eight 152-mm (6-in) guns (including some in the last casemates recorded) were augmented by two twin turrets at a late stage. All went through World War II, emerging with varying degrees of modification, to be scrapped with the 1940s. The ships were the USS ***Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond*** and ***Trenton***.

Specification

'Omaha' class
Displacement: 7,050 tons standard
Dimensions: length 169.3 (555.5 ft); beam 16.8 m (55.25 ft); draught 4.5 m (14.75 ft)
Propulsion: four sets of geared turbines delivering 90,000 shp (67105 kW) to four shafts
Speed: 33.5 kts
Armament: two twin and eight single 152-mm (6-in) and four single 76-mm (3-in) guns, and 10 533-mm (21-in) torpedo tubes
Armour: none
Complement: 360

The 'Omaha' class cruisers were built to complement the proposed 35-kt battle-cruisers of the 1916 programme. The design was modified after the US Navy worked with the Royal Navy in 1917-8; extra guns and torpedoes were added, which meant more crew and a rather crowded vessel.



Brazil

Brazil is the largest country of South America and the fifth largest in the world. It has a growing population and a complex topography with vast impenetrable and partly unexplored jungles forming effective barriers between it and all its near neighbours but Uruguay. To co-ordinate the defence of the country there is no centralized ministry of defence, but instead separate army, navy and air force ministries, a fact which reflects the bitter interservice rivalries that have been found over the years. This manifests itself most visibly in the division of the country into geographic regions for military administration and operational reasons. The army recognizes 11 such regions, the navy seven districts, and the air force six regional commands. Few if any of these regions, districts and commands actually coincide. The services also maintain their own systems of training establishments, although a concession to unity was made when a tri-service senior officers staff college was set up in Rio de Janeiro.

The Army

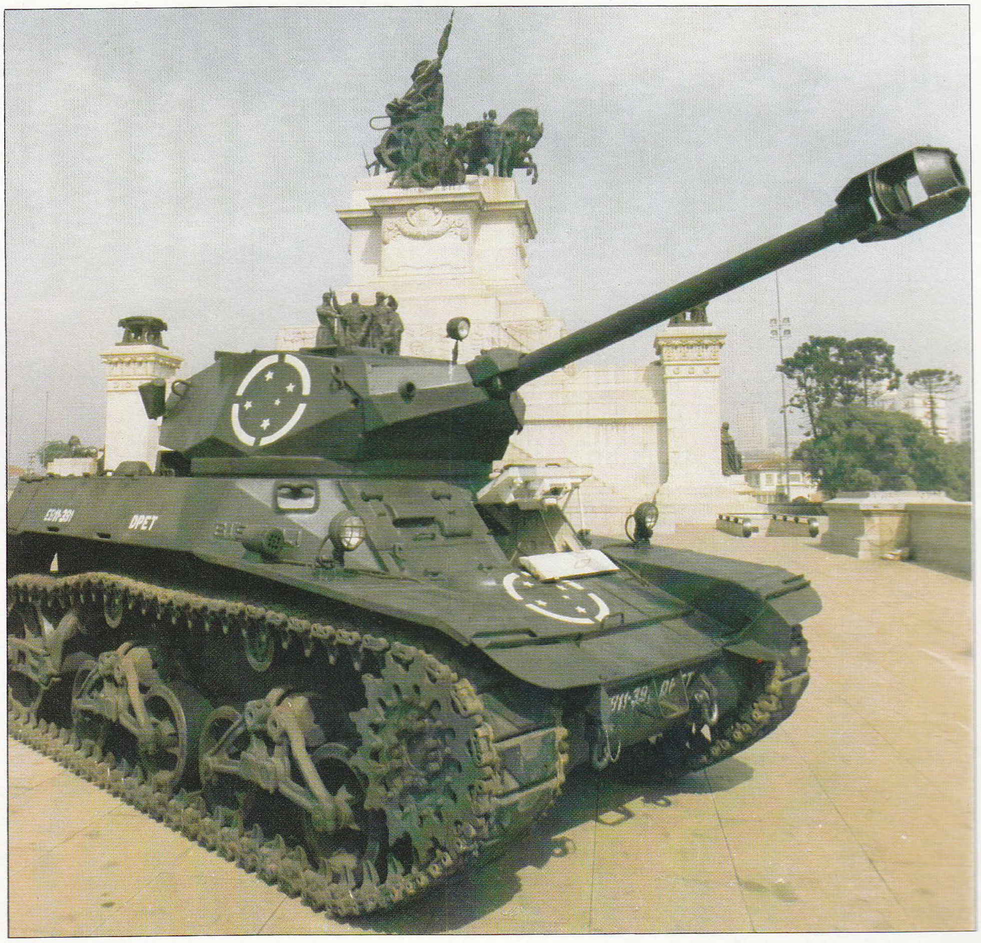
The Brazilian army comprises some 183,000 men of whom the majority (132,000) are one-year conscripts. The army is divided into four armies which have control over a total of eight divisional headquarters. These comprise the following units:

one armoured brigade,
six armoured cavalry brigades,
one armoured infantry brigade
eight mechanized infantry brigades,
21 motorized infantry brigades,
two paratroop brigades (each of three battalions),
two independent infantry brigades,
six independent jungle infantry battalions,
one special forces battalion,
one air-defence artillery brigade,
10 independent air-defence artillery groups,
10 field artillery regiments,
eight coastal artillery groups, and
34 engineer battalions.

There are also 1,115,000 trained first-line and 225,000 partially-trained second-line reservists available for call-up during a conflict.

The equipment used by the army is increasingly of indigenous design, with at least 40 per cent of the country's total military requirements met from its own resources. A viable AFV modernization and manufacturing industry sprang up in the 1960s and is today about to start production of two original MBT designs, the EE-T1 Osorio and the MB-3 Tamoio. In the wheeled AFV field Engesa has the EE-3 Jararaca, EE-9 Cascavel and EE-11 Urutu series, and has become one of the world's leading exporters of such vehicles with customers in North Africa, West Africa, the Middle East and the Far East. There is also a highly successful infantry weapons manufacturing industry but, apart from Avibras and its multiple rocket-launcher (MRL) projects, field artillery has still to be imported. A full list of the equipment used includes:

Artillery: (towed) 75-mm (2.95-in) M116 pack howitzer, 105-mm (4.13-in) M101 howitzer, 105-mm M102 howitzer, 105-mm M56 pack howitzer, 105-mm FH18 howitzer, and 155-mm (6.1-in) M114 howitzer;
(coastal) 57-mm, 152-mm (6-in) Vickers Mk V and 305-mm (12-in) guns;
(self-propelled) 105-mm M7 and 105-mm M108 SP howitzers;



Above: Brazil has a flourishing armaments industry and is now one of the world's leading exporters of wheeled AFVs. The X1A seen here was an early effort: a re-building of elderly M3A1 Stuart light tanks.

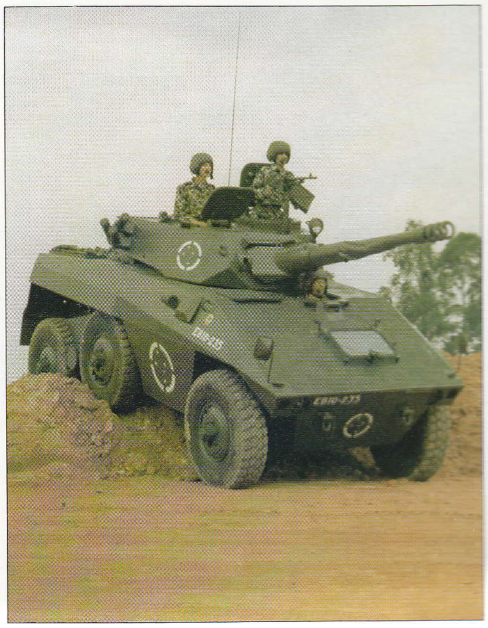
(MRLs) 108-mm (4.25-in) FGT108R, 127-mm (5-in), 180-mm (7.1-in) and 300-mm (11.8-in) ASTROS II; and
(mortars) 60-mm, 81-mm (3.2-in) and 120-mm (4.72-in) Imbel, 81-mm M1, 81-mm M29 and 107-mm (4.2-in) M2;

Anti-armour: SS.11, Cobra and TOW ATGWs; 60-mm (2.36-in) M9A1 and 89-mm (3.5-in) M20 rocket-launchers; 57-mm M18 and 106-mm (4.17-in) M40A1 recoilless rifles;

Air defence: (towed) 35-mm GDF-002, 40-mm Bofors L/60, 40-mm Bofors L/70, 40-mm Bofors L/70 BOFI, 40-mm Bofors M1, 57-mm, 90-mm (3.54-in) M117 and 90-mm M118 guns; and (SAM) Roland II;

Small arms: 0.45-in M1911 Colt, 9-mm M973, 9-mm Beretta M92 and 7.62-mm Mauser pistols; 0.45-in INA, 0.45-in M3A1, 9-mm Beretta M12, 9-mm MPK and 9-mm Uru SMGs; 7.62-mm FAL, 7.62-mm G3, 7.62-mm Para-FAL, 7.62-mm Mosque-FAL, 7-mm Mauser M1908 and 5.56-mm HK33 rifles; 7.62-mm Madsen, 7-mm Hotchkiss, 7.62-mm FN MAG, and 0.3-in and 0.5-in Browning MGs.

A number of light aircraft are used by the artillery and engineer units for observation purposes.



An Engesa EE-9 Cascavel demonstrates the large vertical wheel travel allowed by walking-beam rear suspension. Its 90-mm main armament can fire HEAT, HESH and smoke shell, 44 rounds being carried. The EE-9 has been widely exported, and is in service in Latin America, West Africa and the Middle East.

Rio Grande do Norte (ex-USS Strong) was sold to Brazil in 1973 and is seen here on joint Brazilian/US exercises. She carries one Westland Wasp helicopter.

The Navy

In contrast with the army, the Brazilian navy is predominantly a regular force with only 2,200 conscripts amongst its 41,500 personnel. A continuous modernization programme has ensured that the ships in service are up to date, and the surface fleet is built around a light ASW carrier, the *Minas Gerais*. The sub-surface element is centred on three British-built 'Oberon' class submarines backed by four old US 'Guppy II/III' fleet submarine conversions. The latter are to be partially replaced by two West German 'Type 209' submarines currently under construction. For these and the 'Oberons' a quantity of British Tigerfish heavyweight torpedoes have been purchased. The 10 World War II era destroyers currently in service are to be replaced by a locally built frigate design, the first two of which were laid down in 1983. For operations in the Amazon basin and the Mato Grosso there are two flotillas equipped with river patrol craft and monitors. A complete fleet list includes:

Aircraft-carrier: *Minas Gerais*;
Submarines: three 'Oberon', two 'Guppy II', two 'Guppy III' and two 'Type 209' (building);
Destroyers: five 'Allen M. Sumner', two 'Gearing' and three 'Fletcher';
Frigates: six 'Niteroi' and two (plus up to 10) 'V28' class building;
Patrol craft/monitors: 21 plus two building;
Mine warfare vessels: six coastal minesweepers;
Amphibious warfare vessels: two LSTs, three LCUs, three LCMs and 28 EDVPs;
Support vessels: eight survey ships, seven survey launches, one submarine rescue ship, one repair ship, four transports, four tankers, two hospital ships and 11 training vessels; and
Miscellaneous vessels: 70.

For shipboard operations and liaison duties there is a 700-man naval air arm (the Fôrça Aeronaval da Marinha do Brasil) which, because of inter-service rivalry with the air force, is allowed to operate only rotary-wing aircraft in its four squadrons. One squadron has 13 American- and Italian-built Sikorsky SH-3D Sea King ASW helicopters, the second nine Westland HAS.Mk 21 Lynx ASW/surface strike helicopters, the third eight Westland HAS.Mk 1 Wasp and nine Aérospatiale Ecureuil AS.350 utility helicopters, and the fourth 16 Bell Model 206B JetRangers for training. The fixed-wing component aboard the carrier is provided by the air force with a single squadron of eight Grumman S-2E Tracker ASW aircraft and eight Grumman S-2A Tracker transport, communications and training aircraft.

For amphibious operations there is a 14,500-man marine corps (the Corpo de Fuzileiros Navale) which has an amphibious assault division (comprising an artillery group, a command battalion, three marine infantry rifle battalions, an engineer battalion and a service battalion), a Reinforcement Command (with the Toneleros special operations battalion, an internal security anti-guerrilla infantry battalion, a medical battalion, a service battalion, a transport battalion and an engineer battalion) and 10 regional marine infantry groups for the defence of naval installations. The equipment used includes some 30 M41C light tanks, LVTP-7 amphibious APCs, EE-9 armoured cars, M113 Mod and EE-11 APCs, CAMANF amphibious trucks, 105-mm M102 howitzers, 108-mm FGT108R MRLs, 60- and 81-mm mortars, 7.62-mm G3 rifles, 9-mm Beretta SMGs, and 0.3-in and 0.5-in Browning MGs.

The Air Force

The 45,000-strong Brazilian air force (Fôrça Aerea Brasileira) is split into five commands. The Air-Defence Command comprises only a single interceptor group of two squadrons linked into a nationwide early-warning radar network. The group has a total of 13 single-seat Dassault-Breguet Mirage III EBR (locally known as F103E) and one two-seat Mirage III DBR (F103D) fighters with R.530 AAMs. The Tactical Command has eight groups in total, with two squadrons flying 32 Northrop F-5E Tigers and four F-5B trainers in the close-support fighter-bomber role, five squadrons with around 100 EMBRAER AT-26A Xavante (licence-built Aermacchi M.B.326) jet COIN/advanced trainer aircraft, two reconnaissance/survey squadrons with eight EMBRAER RC-95 Bandeirante and 11 RT-26 aircraft, four composite helicopter/fixed-wing liaison squadrons, and one transport helicopter squadron. The Maritime Command has three joint patrol/SAR squadrons flying Lockheed RC-130E Hercules, P-95 (EMB-111) Bandeirantes, C-95s and Bell UH-1H/SH-1H helicopters. It also includes the ASW squadron for the navy's carrier.

For all the military's internal and external communications and transport flights there is the Transport Command. Divided into six groups of two squadrons each (plus six independent squadrons), the heavy-lift component comprises two squadrons with nine Lockheed C-130E/H Hercules and a third with two KC-130H transport-tankers for inflight-refuelling of the F-5E force. The remainaing squadrons fly some 167 medium and light transports, of which the most important are the 50 C-95, 20 C-95A and 20 C-95B Bandeirantes, 19 C-115s (de Havilland Canada DHC-5 Caribous) and 12 C-91s (BAe 748s). The Training Command has six schools and a radio calibration squadron with some 280 aircraft and helicopters in its inventory. Most of the 130 Aerotec T-23 Uirapuru and Neiva T-25 Universal piston-engine fixed-wing trainers obtained in the 1960s and 1970s are being replaced by about 100 Aerotec YTA-17 Tangaras and 120 EMBRAER T-27 Tucanos.

For the future a joint development programme with Italy has resulted in the AMX light tactical fighter-bomber. The first of 79 for the Brazilian air force are due to enter service in 1987. For this and other fighter aircraft a locally-designed AAM, the MAA-1 Piranha, is due to enter service shortly.

The Brazilian air force is divided into five commands: Air Defence, Tactical, Transport, Maritime and Training. Tactical Command has 100 of these AT-26A Xavantes (Aermacchi M.B.326s, licence-built by EMBRAER).

FORÇA AÉREA BRASILEIRA
SALVAMENT